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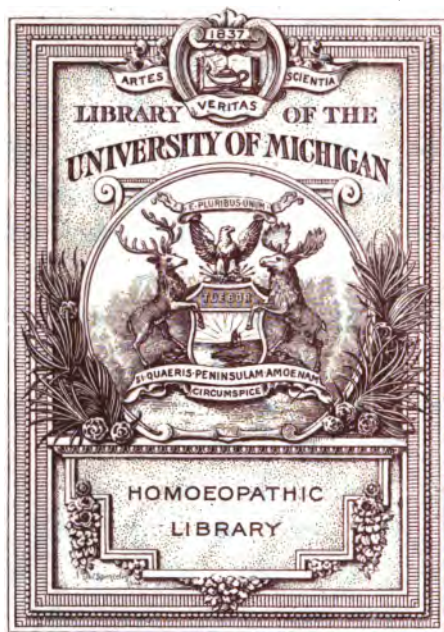
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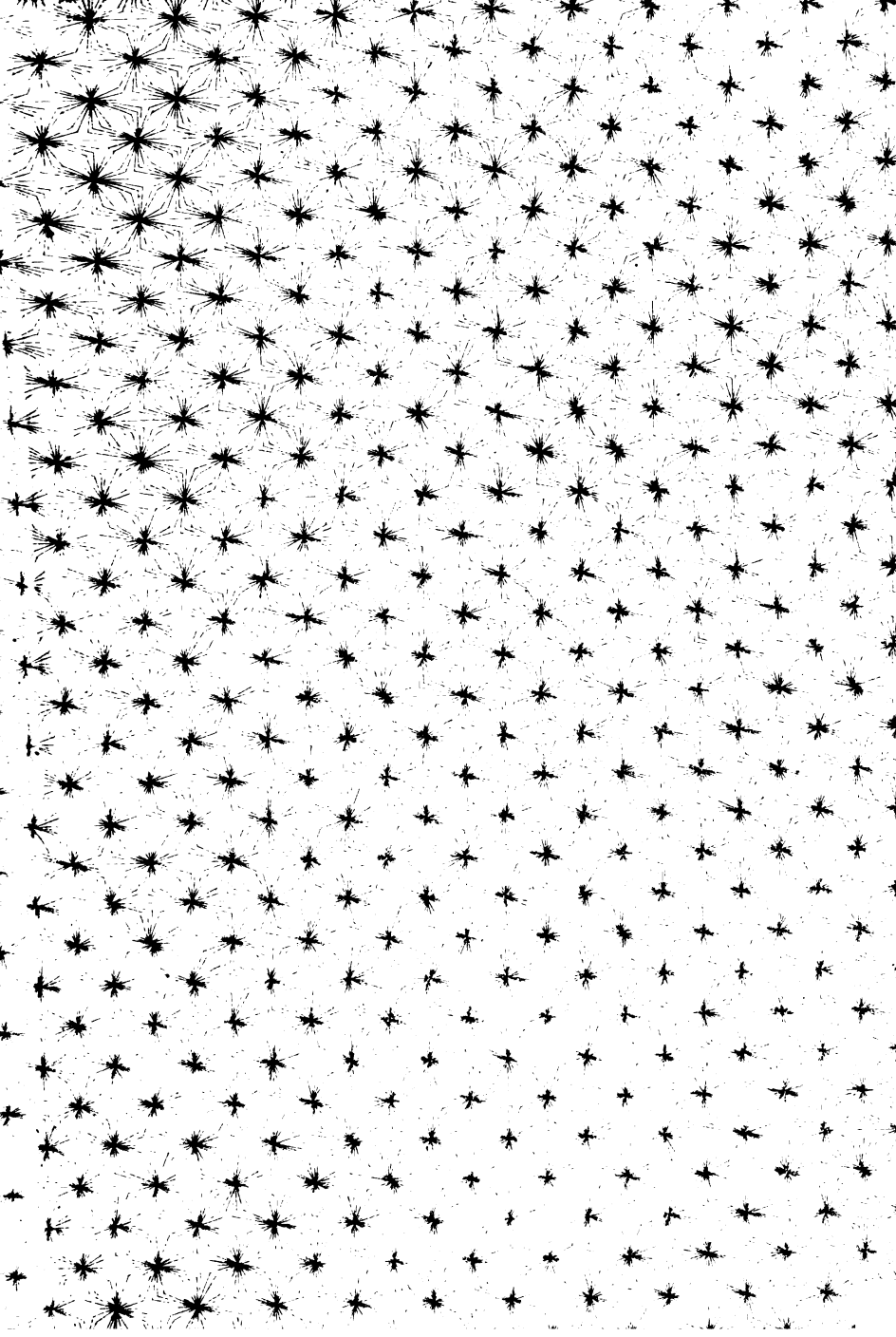
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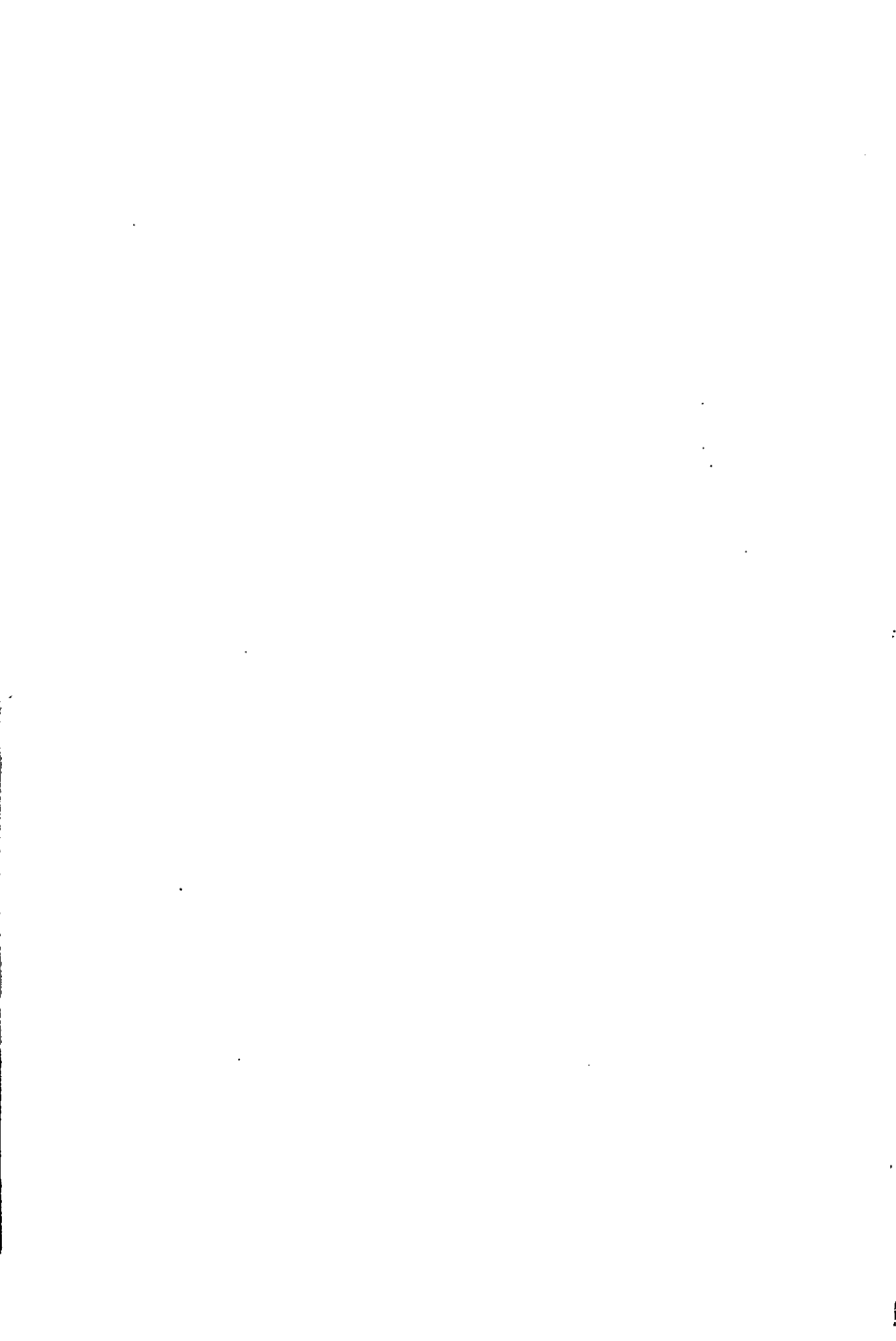
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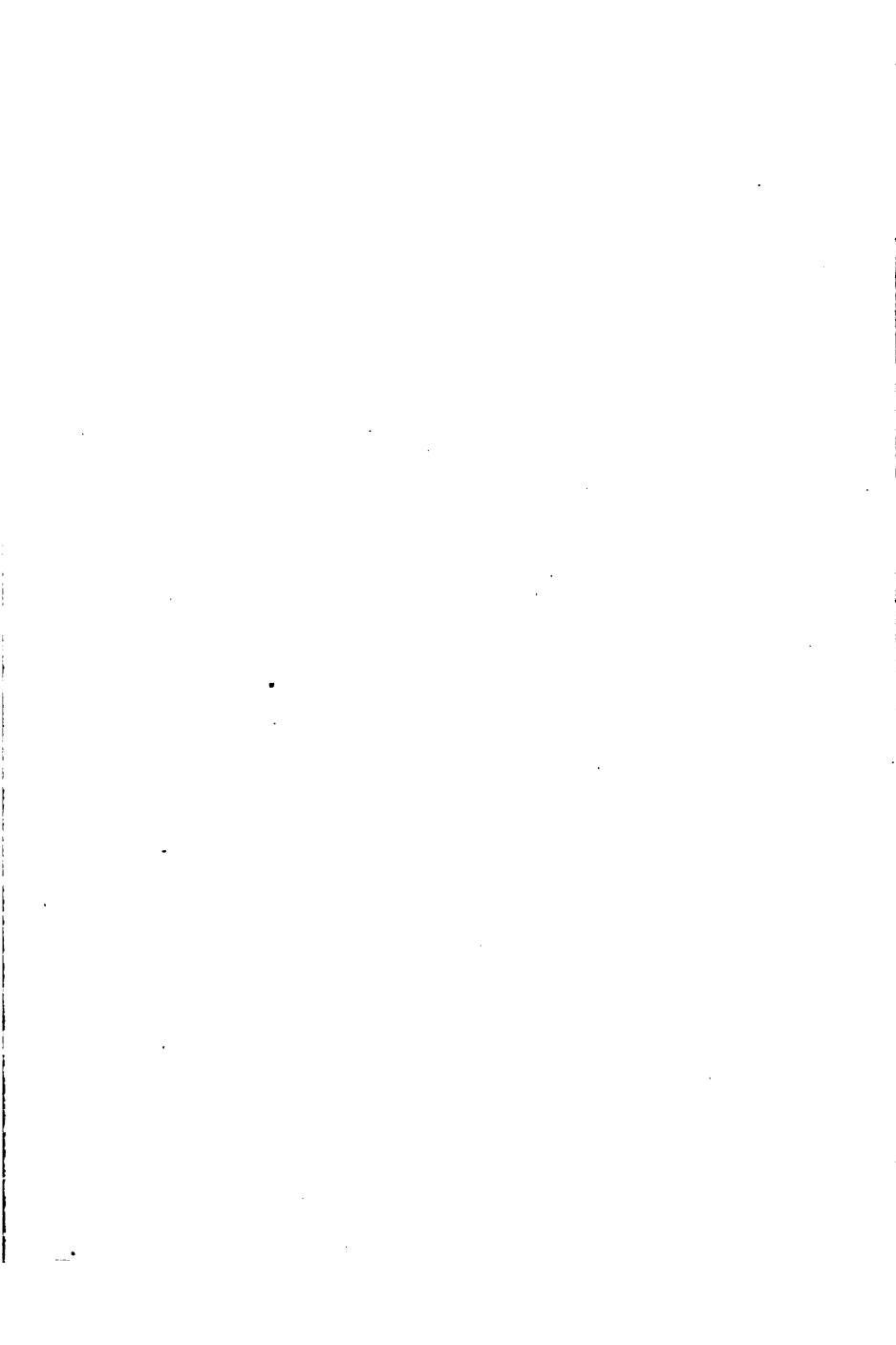






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A MANUAL

— OF —

Practical Obstetrics

BY

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PREFACE

THIS little book is intended to be a *vade mecum* for the busy practitioner. It is not designed as a text-book, but as a ready reference book for the use of the rank and file of the profession. The aim of the book is to furnish a concise outline of the diagnosis, symptomatology and treatment of the various disorders which affect the mother and the child. It is the firm belief of the author that the Homœopathic physician is better equipped to successfully treat the various ills of pregnancy and parturition than his old-school brother. For that reason the administration of the indicated Homœopathic remedy has been advised whenever, in the opinion of the author, its use is proper. At the same time the fact is duly recognized that in certain obstetric emergencies which often confront the physician the use of medicines for their physiological effect is not only necessary but eminently proper. Hence methods of treatment and the administration of drugs in accordance with old-school practice has been recommended by the author in many instances. No apology is necessary for such recommendations, as the methods advised have stood the test of time and experience and give the best results obtainable at the present time. In the preparation of this volume all the

standard authorities upon Obstetrics have been freely consulted. No claim for originality is made by the author. His work has been simply the compilation and arrangement of the essential facts of practical obstetrics in a clear, concise manner. An experience of many years in the teaching of this branch of medicine has been of great assistance in enabling the author to pick out the essential points from the great mass of obstetrical literature. This little work is presented to the profession in the hope that there may be a place for it in medical literature and that it may worthily fill the place.

FREDERICK W. HAMLIN, M. D.

New York, June 1st, 1908.

Manual of Practical Obstetrics.

Abortion. The term *abortion* is applied to the expulsion of the ovum before the fourth month. *Premature labor* signifies that the child is viable. The twenty-eighth week is recognized as the earliest limit of viability. *Miscarriage*, or *immature delivery*, is the term applied to the expulsion of the ovum in the time intervening between the fourth and the seventh month of pregnancy.

Etiology. The fundamental causes of abortion, miscarriage, and premature labor are the same. Changes take place in the ovum, or pathological conditions affect the mother, and a disposition to abortion is produced. In most cases the death of the fetus precedes its expulsion and leads to disease of the chorion. The causes of the death of the fetus will, therefore, be the causes of abortion in the majority of cases.

Exciting Causes. Violent coitus, blows, falls, contusions, railroad travel, missteps, the running of a sewing machine, lifting of heavy weights, rapid stair-climbing, sea-bathing, etc.

Predisposing Causes. *Paternal.* Syphilis, extreme youth or old age, debauchery.

Maternal. Tuberculosis, syphilis, acute infectious diseases, diseases of the heart, lungs, liver,

and kidneys, chronic lead poisoning, convulsive diseases such as chorea, eclampsia, epilepsy, excessive vomiting and coughing, excessive physical exertion, fright and anxiety. Among the local causes may be mentioned subinvolution, acute and chronic inflammatory diseases of the uterus and its appendages, tumors, displacements, adhesions, degenerations.

Fetal. Syphilis, hydrorrhea gravidarum, cystic degeneration of the chorionic villi, various degenerations of the placenta, placenta previa, short cord.

Clinical History. The first symptom of an abortion is *hemorrhage* more or less profuse, and generally continuous. After a variable time uterine contractions occur causing *pain*. The cervical canal becomes expanded, the external os dilated, and the ovum is either forced out entire imbedded in a large clot, or the embryo is first expelled, and the membranes follow. This history is that of a typical abortion, which is comparatively rare.

In most cases after the second month there are present symptoms which indicate that abortion is *threatened*. These symptoms are: shifting pains in the back and abdomen, frequent urination, sometimes nausea and vomiting, and a mucous or watery discharge from the uterus.

The hemorrhage in abortion may be exceedingly profuse and alarming. It may precede pain many hours, days or weeks, or may occur with pain. It may be slight at first, cease for a time, and

then recur, or it may begin with a sudden profuse flow. The hemorrhage may be continuously taking place from the uterine surface, but may appear at intervals only externally in the form of clots. This is termed concealed hemorrhage and is not common before the fifth month. The hemorrhage usually continues until the uterus is empty. The amount of blood lost is usually greater in amount in early abortions (before the tenth week) and decreases in amount in the later months.

The pains in abortion vary considerably in severity. Many patients claim that they are harder to bear than those of normal labor.

There are two varieties of abortion :

The normal or complete, in which the ovum is either expelled with the membranes complete, or is soon followed by the membranes expelled entire.

The abnormal or incomplete, in which a portion of the ovum or its membranes remains in the uterus. In such cases the woman is always in danger of hemorrhage or sepsis. In these cases of incomplete abortion a retained portion of decidua or placenta may develop into a polypus which may remain for weeks or months in the uterus without decomposition, fetid discharge, or rise of temperature. As a rule, however, fragments of decidua or placenta left behind undergo decomposition and cause a septic infection.

Diagnosis. We must first determine the existence of pregnancy. This may usually be learned from the history of the patient, but may require a vaginal examination. Abdominal pain and uter-

ine hemorrhage may occur from dysmenorrhœa, and from sub-mucous fibroid tumors. If, on bi-manual examination, the uterus is found to be only slightly enlarged, the diagnosis of abortion is fairly certain. An examination of the discharges should, however, always be made. The hemorrhage may come from an erosion of the cervix, from carcinoma, or from a cervical polypus.

Extra-uterine pregnancy must be excluded. At times a careful bi-manual examination under an anesthetic may be necessary to determine this question. If chorionic villi can be found in the discharges, the diagnosis is certain.

We must next decide whether the abortion is simply *threatened*, whether it is *inevitable*, or whether it has been *completed*.

Threatened abortion; os uteri undilated, cervical canal not expanded, hemorrhage not profuse, pains easily controlled.

Inevitable abortion; os usually dilated, cervical canal expanded or expanding, the angle between the upper and lower uterine segments effaced, uterine contents forced down within reach of the finger with each pain, hemorrhage and pains persistent.

Prognosis. In spontaneous abortion the danger to life is very slight. Neglected or badly managed cases of abortion frequently result in subinvolution, chronic metritis, and endometritis. Anæmia with great debility is frequently observed after a neglected abortion. A more or less marked degree of septic infection may result from retained prod-

ucts, and secondary infections such as suppurative arthritis may develop. Septic infection is much more virulent in its nature in cases of criminal abortion and often proves highly fatal. Functional diseases of the nervous system, varying from slight mental depression to actual insanity, may depend upon pathological conditions resulting from a badly-treated abortion.

Treatment.—Prophylactic. All local causes, especially displacements of the uterus, should be carefully sought for and appropriate treatment instituted, before conception occurs again. If syphilis be suspected as the cause, both parents should receive thorough treatment for a sufficiently long period, and the treatment of the mother should continue throughout the pregnancy. Hygienic rules should be carefully observed, and all possible sources of irritation removed. In cases of habitual abortion at least one year should elapse after the last abortion before pregnancy again occurs. Rest in bed for several days at the times corresponding with the menstrual periods should be ordered. This rest should be absolute. Sexual intercourse should be absolutely forbidden. In some cases it is necessary to keep the patient in bed the greater part of the time in order to carry the pregnancy through to term.

Treatment of threatened abortion. Put the patient to bed in a cool, darkened room, and enjoin absolute rest. She must not rise for any purpose whatever. Visitors should be excluded. Quiet and freedom from worry of any kind must be se-

cured. The diet should be nutritious and easily assimilated, but non-stimulating. The medicinal treatment should consist in the administration of the indicated Homœopathic remedy. The most frequently indicated remedies are the following:

Aconite. Impending abortion from anger or fright, fear that something terrible will happen to her; dizzy on rising from a recumbent position; afraid to turn over, to move, or to leave the bed.

* *Aletris farinosa*. Habitual tendency to abortion in feeble persons of lax fibre and anæmic condition; weight in uterine region, tendency to prolapsus uteri; general weakness of mind and body; weak from long sickness or defective nutrition.

Apis mell. Stinging pains in one or the other ovarian region, more and more frequent, till labor pains are produced; urine scanty; no thirst; miscarriage in third and fourth month with profuse flow.

Arnica. Threatened abortion in consequence of a shock or injury; bruised feeling all over, so that it hurts her to move.

Belladonna. Violent aching and tensive pains through whole body with sensation of constriction and tension; pains and discharges come suddenly and cease as suddenly; pressing toward vulva, as if all internal organs would be pushed out; pain in back as if broken; more or less discharge of blood which feels very hot in passing out; cerebral congestion and moaning, which gives temporary relief. Aggravation from jar.

Caulophyllum. Severe pains in back and loins

threatening abortion, with great lack of uterine tonicity; uterine contractions irregular, feeble, and attended with only slight loss of blood. Habitual abortion from uterine debility.

Chamomilla. Threatened abortion from anger; labor pains begin in back and pass off down inner side of thighs, with great nervous excitement and with more or less discharge of dark, offensive blood and frequent urination; great agony and restlessness; heaviness of abdomen; yawning, chills and shuddering.

Cimicifuga. Habitual abortion in women of rheumatic tendencies; pains fly across the abdomen from side to side, especially from right to left, and seem to double the patient up; abortion following fright.

Ferrum met. Atony of sexual organs, great tendency to abortion, excessive nervous erethism and flowing; pains accompanied by a fiery-red face, she feels very weak.

Helonias. Threatened abortion from atonic conditions; the slightest over-exertion or irritating emotion tends to cause the loss of the foetus.

Kali carb. Abortion during second or third month; weak back, labor pains begin in back and pass from lumbar region down to buttocks and thighs; backache when walking, must lie or sit down.

Rhus tox. The patient had a strain or wrench, or she slipped and tried to save herself; pains worse in latter part of night, must move often to find relief; cramps in calves.

Sabina. Abortion during third month, pain commencing in small of back and going around and through pubes; drawing aching pains from sacrum to pubes; bright-red, clotted flow of blood, aggravated by every motion, followed by a flow of dark-red, clotted blood.

Secale cor. Threatened abortion, especially about the third month, with copious flow of black, liquid blood; tingling all over body, relieved by having the limbs rubbed; she holds her fingers spread asunder, which bothers her more than the hemorrhage; wan, sunken countenance, filiform pulse, fear of death.

Trillium. Profuse flooding, bright red, when sacro-iliac synchondroses feel as if falling apart; wants to be bound tightly; third month.

Viburnum op. Threatened miscarriage, pains begin in back, come around either side of the hypogastrium and culminate in intense squeezing, cramping and bearing down, going down into the thighs.

Viburnum prun. Uterine pains during gestation with strong bearing down, thus threatening to rupture the membranes and produce miscarriage.

The *old school* treatment consists in the administration of Opium in rectal suppositories, and teaspoonful doses of the fluid extract of *Viburnum prunifolium* three times daily.

Treatment of inevitable abortion. The main indications for treatment are to control hemorrhage and to secure complete evacuation of the uterus. The vagina and external genitals should

be rendered as aseptic as possible before any treatment is instituted. The free use of hot water, green soap, and an antiseptic solution is necessary. If the hemorrhage is severe before the os is dilated or any portion of the ovum discharged, the *vaginal tampon* should be employed. The tampon, when correctly applied, not only controls the hemorrhage, but also stimulates uterine contractions. The best material for the tampon is sterile or iodoform gauze. In an emergency any soft fabric, such as a silk handkerchief, a soft towel, strips or pieces of sheeting, cheese-cloth, etc., may be utilized. Whatever material is used must be thoroughly sterilized by boiling, dry heat, or thorough scalding in a hot antiseptic solution. A copious, hot vaginal douche should be given before the tampon is introduced. If assistance is at hand, a Sim's speculum aids in the packing. If no assistant is present, one or two fingers of the left hand in the vagina act as a guide. The packing should be accurately done to be efficient, and the vagina should be moderately filled. An antiseptic pad and T bandage should then be applied. The tampon should be removed within twelve hours. Frequently the whole ovum or the fetus alone will be found, when the first tampon is removed. If the ovum has not been expelled, a second tampon should be introduced. When the second tampon is removed, and the abortion is not complete, a digital examination of the interior of the uterus should be made. It may be necessary to anesthetize the patient, and placental forceps and

curettes should be at hand. The interior of the uterus should be thoroughly explored by the finger, and all retained products carefully removed. If unable to remove everything with the finger, the curette should be carefully used to complete the operation. After the curettage the cavity of the uterus should be irrigated with plain sterile water, creolin (1-2 per cent.) or boric acid (4 per cent.). The tampon should not be used in cases of abortion after the fourth month, as the cavity of the uterus is then sufficiently large to contain considerable blood.

Treatment of incomplete abortion. The recurrence of hemorrhage and pain after the apparent completion of an abortion, associated with a slightly dilated os and a flabby cervix, especially if an odor of decomposition is present, affords conclusive proof that some portion of the ovum remains in the uterus. Active interference should be the rule in such cases, as hemorrhage and sepsis are ever-present dangers. If the cervix is not dilatable by the finger, a steel dilator should be employed, and the uterus completely emptied either by the finger or the curette. Antiseptic irrigation of the uterus and vagina should follow the operation, and antiseptic vaginal douches should be used for several days. It is well to remember that the fundus of the uterus can be brought within better reach of the finger by the use of counter-pressure from above through the abdominal wall. The septic infection following neglected cases of abortion is, as a rule, easily controlled by proper treatment except in criminal cases.

After treatment of abortion. Rest in bed for at least a week, and longer if necessary, should be a cardinal rule in the after-management of a case of abortion. Involution, while usually rapid, if active treatment has been employed, may be retarded in cases treated by the expectant method, and the woman should not be allowed to leave the bed until involution is complete. The indicated Homœopathic remedy after abortion is often *China* prescribed upon the well-known symptom, anæmia and general weakness from loss of fluids. Other remedies such as *Helonias*, *Kali carb.*, *Phosphorus* and *Sulphur* may be indicated.

Accouchement forcé. This term is used by obstetricians to indicate rapid delivery of the child. It includes three operative procedures: (1) The complete instrumental or manual dilatation of the cervical canal. (2) Version, or the application of forceps. (3) The immediate extraction of the child. Deep cervical incisions are sometimes employed where great haste in delivery is necessary. Four clean incisions are made from the edge of the external os to the utero-vaginal junction. The extraction of the child must not be attempted, until full dilatation has been secured and the external ring of the os paralyzed. Accouchement forcé has been advised in eclampsia, placenta previa, and in heart disease complicating pregnancy. This recommendation, however, does not meet with unanimous approval.

After-Pains. These painful contractions of the uterus after delivery are caused by lack of firm

contraction or retraction of the uterus, and the consequent accumulation of blood clots in the uterine cavity. Primiparæ do not suffer from after-pains as a rule, unless the uterus has been unduly distended, or the labor has been prolonged, or too precipitate. Multiparæ as a rule suffer more or less with after-pains, which demand treatment and relief. The routine treatment is Ergot to secure firm contraction of the uterus, and Opium in some form to relieve the pain. If care be taken to press out the clots from the uterus, the pain can usually be controlled by the administration of one of the following *Homœopathic* remedies:

Arnica. Should be administered immediately after delivery; especially indicated by the bruised condition of the genital organs and the strain of the general muscular system; often prevents severe after-pains.

Belladonna. Pains come on suddenly and disappear after a time suddenly; severe bearing down with the pains; any jar of the bed is very unpleasant; the lochial discharge feels very hot; head and eyes congested.

Bryonia. The least motion, even taking a deep inspiration, excites the pains. Headache as if the head would split. Thirst for large draughts of cold water; parched lips and dry mouth.

Caulophyllum. After protracted and exhausting labor; spasmodic pains across the lower part of the abdomen or extending into the groins.

Chamomilla. The pains are very distressing, and she feels that she cannot bear them. She is

irritable and ill-natured. Lochia dark colored. Desire for fresh air.

Coffea. She is sleepless; pains very distressing, and she feels them very acutely. Desires to sleep, but unable to do so.

Cuprum. Terrible cramping pains; pains which often produce cramps of the extremities, including the fingers and toes.

Gelsemium. Pain is severe, and inclines to run upward, or upward and backward.

Ignatia. Much sighing, sadness and despondency with the after pains.

Nux vomica. Every pain causes a desire to go to stool, or there is a constant sensation as though there was something in the rectum which should be evacuated. A sore feeling in the region of the uterus so that she dreads being moved or disturbed in any way. Inclined to be irritable. She likes to have the room warm and to be well covered. Fainting after every pain.

Pulsatilla. For women of mild and tearful disposition; pains worse toward evening; no thirst; bad taste in the mouth. She feels uncomfortable if the room is warm and has great desire for cool, fresh air.

Rhus tox. Pains are always worse at night with great restlessness. Frequent desire to change her position, which change relieves for a short time. Likes a warm room and warm coverings. Sometimes cramps in calves.

Secale corn. Especially adapted to thin, scrawny women; the pain is prolonged with some bearing

down. Although she may feel cold, yet she does not wish to be covered.

Agalactia. A strict definition of this term would be absence of milk. Complete absence of milk is exceedingly rare. Deficient secretion of milk is by no means uncommon. It may result from extreme youth or advanced age of the mother. The size of the breast is no evidence as to its ability to furnish a sufficient amount of milk for the child. A large mammary gland may consist mainly of connective tissue, while a small breast may contain abundant gland-tissue and furnish an ample supply of milk. If the first child is not nursed at the breast, it is more difficult to awaken functional activity after subsequent deliveries. Extreme obesity interferes seriously with the normal functional activity of the mammary gland.

Treatment. It is obvious that no single line of treatment will prove efficacious in all cases of deficient milk secretion. It is also evident that in many cases no treatment will prove successful. It should be remembered that lactation interrupted by an acute febrile attack may be successfully resumed, even though weeks have elapsed. Electricity has been highly recommended as a remedy for scanty milk secretion. It may benefit some cases, but often disappoints. Forced feeding with the addition of extract of malt at meals is a measure deserving a faithful trial. The following Homœopathic remedies have proved useful:

Aconite. Mammæ congested, burning hot, hard and distended, with little or no milk. Anxiety and restlessness.

Agnus cactus. Frequently indicated, particularly when a despairing sadness is the predominant symptom.

Asafoetida. Excessive sensibility of the whole organism. Veins unusually distended.

Calcarea carb. Leucophlegmatic constitutions. Rather of a chilly nature; menses had been too often and too profuse; usually subject to leucorrhœa.

Causticum. Anxiety and despondency; the woman has been subjected to night-watching, care and trouble.

China. Debility from loss of animal fluids—particularly blood—or from diarrhœa or leucorrhœa. Much pain between the shoulders.

Dulcamara. Suppression of milk from exposure to the cold or damp air. The milk is scanty, the skin is delicate and sensitive to cold, and liable to eruptions from exposure to cold.

Phosphoric acid. Scanty milk, debility and great apathy.

Pulsatilla. In mild and tearful women, in apparent good health, who have but little milk. A frequently indicated remedy.

Secale corn. In women who are much exhausted from venous hemorrhage. In thin, scrawny women. The breasts do not properly fill with milk; there is much stinging in them.

Sulphur. Flushes of heat and faint spells, heat on the top of the head, cold feet, very faint and hungry about noon, she cannot wait for her dinner.

Albuminuria in Pregnancy. Renal albuminuria resulting from pregnancy is found in about 5 per cent. of pregnant women. This estimate excludes cases in which albumin is present in the urine from admixture with pus, blood, or mucus. Albuminuria is encountered most frequently in hydræmia from the watery state of the blood, and in excessive distention of the uterus, as in hydramnios, and in multiple pregnancies. The presence of abdominal tumors, such as large fibroids or ovarian cysts, increases the tendency to albuminuria. It is more common in primiparæ owing probably to greater intra-abdominal tension. It is found far more frequently in the latter half of pregnancy. Tight lacing and heavy skirts aggravate the disorder. It is well to remember that albuminuria in pregnancy may be merely the continuance of an albuminuria, which had existed before the pregnancy. In some cases it can be traced back to an attack of scarlet fever in childhood, which was followed by a nephritis, from which recovery had seemingly taken place. The strain of pregnancy brings back the old trouble. The actual cause of albuminuria in every case may be difficult to discover. Mechanical pressure on the renal blood-vessels is certainly a predisposing cause. The retention in the blood of certain toxic products which should be excreted is believed to be the principal exciting cause of the condition.

Treatment. If the albuminuria is but slight and occurs only in the latter months, and the excretory activity of the kidneys is normal, as indicated by

the total amount of solids, dietetic and hygienic management may be sufficient. The case should be kept under careful observation, and frequent examinations of the urine made. The amount of meat eaten should be reduced. Large drafts of water should be systematically drunk. Exposure to cold and wet feet should be carefully avoided. Albuminuria does not necessarily mean that uræmia is present in a corresponding degree. There may be much albuminuria and little uræmia, and *vice versa*. Severe forms of albuminuria are usually dependent upon the existence of a true nephritis, and the proper treatment will be given under diseases of the kidney in pregnancy.

Amnion, Diseases of.

1. *Oligo Hydramnios*. A diminished amount of liquor amnii. The cause of this condition is unknown. It may seriously interfere with the growth of the fœtus and result in various deformities due to abnormal pressure. Adhesions and bands are frequent. It cannot be detected prior to delivery. The labor is apt to be tedious owing to the absence of the fluid wedge which the amniotic fluid usually forms.

2. *Hydramnios, Polyhydramnios, or dropsy of the amnion*. An excess of liquor amnii. When this fluid exceeds two quarts and give rises to symptoms of over-distention, hydramnios is said to be present.

A comparatively rare disease occurring once in 150 to 200 confinements. It occurs more frequently in multiparæ and in twin pregnancies.

The cause of the condition is not definitely known. Hydramnios does not usually develop before the fifth or sixth month of gestation, although it may appear as early as the eighth week. The first sign to attract attention is the undue enlargement of the abdomen. The uterus at five months becomes as large as it should be at term. Except in extreme cases it is possible to detect the fetal heart sounds and to practice ballottement. Pressure symptoms, such as oedema of the lower limbs, palpitation of the heart, and dyspnœa become prominent. Locomotion is painful, sometimes impossible. Distinct fluctuation can be felt on palpitation over the abdomen. Mechanical interference with the functions of the liver and the kidneys may cause albuminuria or jaundice. The uterine walls, as well as the abdominal walls, are overdistended and thinned. There is undue mobility of the foetus. Vaginal examination reveals a nearly or quite obliterated cervix, and the tense membranes may often be felt. Hemorrhage from low implantation of the placenta is not rare, and the overdistention of the uterus predisposes to hemorrhage during and after labor. This is the usual history of hydramnios occurring gradually, so that the uterus may tolerate its pressure to a surprising degree. There is, however, an *acute* variety of the disease in which the distention is exceedingly rapid, and the symptoms very grave. In these rare cases there is intense pain in the uterus. The breathing becomes labored, and orthopnœa develops. The face is cyanosed and

bears an anxious expression; constant and distressing vomiting appears, and there is fever. Fortunately nature often comes to the rescue by spontaneous rupture of the membranes, and premature labor results. Hydramnios must be differentiated from twin pregnancy, ascites, hydorrhœa gravidarum, and ovarian cyst.

Treatment. In the acute form the induction of labor is generally demanded. The membranes should be ruptured, and the liquor amnii allowed to drain away slowly. In the chronic form a properly fitted abdominal support and comparative rest will often carry the case along to term. If alarming symptoms, especially of cardiac disturbance, develop, interference is necessary. In puncturing the membranes it should be remembered that the sudden exit of so much fluid may cause syncope and also predisposes to malpositions of the fetus and prolapse of the cord. Post-partum hemorrhage should be expected and guarded against.

3. *Amniotic bands and adhesions.* Early in the life of the embryo, owing to an insufficient quantity of amniotic fluid, the amnion may become attached to the skin, and, as the amniotic cavity is distended, these adhesions stretch until they form bands of more or less thickness. These bands closely resemble in composition the plastic material thrown out in inflammations of serous membranes. They contain no blood-vessels. Extensive adhesions may occur between the fetus and the amnion, resulting in marked deformities and

frequently causing intra-uterine amputation. The developing limb is caught between two of these bands and so constricted that the blood supply is entirely cut off. Various malformations, as webbed fingers and toes, hernia cerebri, dislocations and fractures, are attributed to these bands.

Anaemia of Pregnancy. Temporary anæmia is often noticed in the first three months because of the inability of the patient to retain and assimilate sufficient food. After that time nutrition improves in normal cases, and the blood becomes richer in corpuscles and hemoglobin than in the non-pregnant condition. Anæmia in pregnancy is produced by the same causes which influence the non-pregnant. When pregnancy occurs in a woman already anæmic, the anæmia may become a serious complication. In rare cases the anæmia takes the pernicious form with progressive loss of strength, emaciation, and tendency to syncope. The ordinary symptoms of anæmia are present in an aggravated form. Such symptoms are: a tendency to fainting, vertigo due to cerebral anæmia, and a weak heart with attacks of palpitation on slight exertion. Nervous disorders are aggravated by the co-existence of severe anæmia and pregnancy, while in those predisposed by inheritance or by nervous temperament, insanity is more liable to result.

Treatment. Successful treatment of this condition must be based upon a thorough study of the case. The work of the stomach, liver, intestinal tract, and kidneys must all be carefully investi-

gated. It is useless to treat the anæmia itself, unless faults of digestion and elimination are corrected. When the bowels are torpid and the colon loaded with fecal matter, little progress will be made until these conditions are removed. The diet of anæmic patients should be ample, but should consist of easily digestible foods. When the stomach is so weak that but little food can be taken, give such concentrated foods as Bovinine, Murdock's liquid food, Liquid Peptonoids, Hema-boloids, or Panopepton between meals. In severe cases of anæmia the induction of premature labor may be necessary to save the life of the mother. This procedure should not be delayed too long until the patient's vitality is so far exhausted that she cannot rally. The old school remedies for anæmia are *Arsenic* and *Iron*. It is claimed that *Iron* does not act as well during pregnancy as in the non-pregnant. The Homœopathic remedies are usually efficient, if carefully prescribed. If grief or other depressing emotions have disturbed the digestive functions and thus impaired nutrition, a choice may be made from *Arsenicum*, *Aurum*, *Causticum*, *Cocculus*, *Ignatia*, *Lachesis*, *Phosphoric acid* and *Phosphorus*.

If previous hemorrhage, or prolonged lactation, have caused the anæmia, consult *Arsenicum*, *Calcarea carb.*, *China*, *Ferrum ars.*, *Ferrum met.*, *Nux vom.*, *Phosphoric acid*.

If the anæmia result from chronic malarial infection, study *Arsenicum*, *Cedron*, *China*, *Ipecac* and *Natrum mur.*

Anesthesia in Labor. The use of anesthetics in obstetric operations, in eclampsia, and in unusually severe labors is almost universal. The use of anesthetics, however, to relieve the pains of labor in a normal case is by no means a settled rule of practice. The objections to their use depend upon the belief that they prolong the labor, that they favor uterine relaxation and consequent danger of post-partum hemorrhage, and that their employment is not without danger to the patient. The weight of authority disproves all of these objections, when the anesthetic is properly administered. There is, therefore, no good reason for refusing to relieve the pains of labor by an anesthetic unless strong contra-indications exist. The term *obstetric anesthesia* is used to denote a condition in which the patient is still conscious, but the severity of the pains is greatly lessened by the anesthetic. As a general rule, the use of anesthetics should be reserved until the latter part of the second stage. They may be employed in the first stage to subdue great nervousness or excitement, or to relieve pains of unusual severity. In some cases in which the pains are irregular and inefficient, the use of an anesthetic accelerates labor by quieting the nervous irritability. When anesthesia is required to the surgical degree the same dangers exist as in all cases. The parturient woman has no special immunity. The relative safety of obstetric anesthesia lies in the mode of administration, the limited dosage, the slow and gradual inhalation, and the intermittent use of

the anesthetic. If an obstetric operation is necessary, neither diseases of the heart, lungs nor kidneys forbid their use. Increased caution in administration is necessary under such conditions.

Choice of anesthetic. For obstetric anesthesia chloroform is to be preferred. When complete insensibility is desired, many physicians prefer ether on account of the belief that ether is safer for prolonged administration. In acute inflammation of the air-passages and in nephritis chloroform should be chosen.

Method of administration. The patient should be prepared to take the anesthetic by loosening the clothing, removing false teeth, and protecting the lips, nose and chin from the irritating effect of chloroform vapor by vaseline or glycerin. An Esmarch inhaler is the most convenient apparatus for administration. A large handkerchief or towel spread in one thickness over the face, and lifted by the middle so as to form a large air chamber about the face, may be used. A large admixture of air is absolutely essential in chloroform anesthesia. As the pain begins, the inhaler is placed over the patient's face, and a few drops of the anesthetic are dropped upon the inhaler opposite the mouth. When sufficient effect is not obtained in this manner, the patient is directed to breathe rapidly as the pain is coming on. The inhaler is removed in the interval between pains. During the severe pains at the close of the second stage, the anesthesia may be pushed nearly or quite to the surgical degree. Anesthesia to the obstetrical degree

may safely be intrusted to a competent nurse under the physician's direction. Anesthesia to the surgical degree for operative interference requires a skilled medical assistant.

Other Anesthetic Agents. Chloral is especially useful in the first stage of labor and in primiparæ, with whom the dilatation of the os takes place slowly. In cases in which dilatation is slow or unusually painful, and in which the pains are irregular or spasmodic, much benefit will be derived from the use of this anesthetic. From 45 to 60 grains may be given in doses of 15 grains repeated every twenty minutes. The total quantity should not exceed one drachm. Chloral is so irritating that it must be well diluted to ensure its retention. Water and syrup of orange peel are suitable diluents for its internal administration. A mixture of milk and yolk of egg, or mucilage of slippery elm form suitable media for rectal administration. Diseases of the stomach and of the heart contraindicate chloral. The former would certainly be aggravated, and in the latter chloral is decidedly dangerous. The condition of the heart should always be carefully investigated before chloral is employed.

The application of cocaine to the cervix and vagina to relieve pain in labor has not been successful.

The bromide of ethyl has been used in obstetrics, but its action upon the heart is so depressing that it is not safe.

Antisepsis. The present antiseptic method of handling obstetric cases dates from 1847. Semmelweis, an assistant in the Lying-in Department of the Vienna General Hospital, deserves the credit of the discovery that a very large percentage of the mortality in confinement cases was due to infection, conveyed to the patient by the hands of the attending physician. By requiring the students to wash their hands in chlorine water before making internal examinations, and by restricting the number of such examinations he reduced the mortality in the hospital from 10 per cent. to less than 2 per cent. It was not, however, until 1870 that the antiseptic treatment of confinement cases became general. While the routine practice of antiseptic precautions in hospitals has reduced the mortality from septic causes to almost nothing, there is still a high mortality in cases confined in their own homes. There is, therefore, much room for improvement in the obstetric methods of the general practitioner.

Antiseptic Agents. Heat is the most generally available and the most reliable germicide.

Dry heat. Exposure for three hours to a temperature of 284° F. kills all pathogenetic organisms and their spores. A special apparatus may be used or the oven of a cooking range. A thermometer capable of registering 300° F. is necessary. This method may be employed for metallic instruments and most utensils, but the length of time required renders it unsuitable for general use.

Boiling. A useful method of sterilizing most instruments. The addition of one per cent. of chem-

ically pure washing soda helps to remove fatty matter from the instruments and also prevents rusting. The boiling should continue from ten to fifteen minutes. A dish-pan or a wash boiler may be used in the absence of a special sterilizing apparatus.

Steam. Sterilization by steam requires special apparatus. The Arnold steam sterilizer, or one of its modifications, is cheap and convenient. Instruments should be removed promptly on opening the sterilizer, as the entrance of cool air immediately condenses the steam and tarnishes the polished steel surfaces. Exposure for thirty minutes to flowing steam at a temperature of 212° F. gives thoroughly reliable sterilization.

Chemical Antiseptics. The most useful chemical germicides are the mercuric chloride and iodide, and carbolic acid. Creolin, Lysol, and numerous other antiseptics are in common use, but offer no special advantage. Liquor sodæ chlorinatæ, peroxide of hydrogen, and iodine water are efficient non-toxic antiseptics. Mercuric chloride is decomposed in the presence of alkalies or of albumin. A plain sublimate solution, therefore, soon becomes inert if mixed with bloody fluids. It is necessary to add five parts of tartaric, acetic, or hydrochloric acid to each part of the bichloride to prevent precipitation of the mercury. The biniodide of mercury requires the addition of an equal weight of the iodide of potassium to render it freely soluble. The two salts are equally active as germicides and are used in strengths of from $\frac{1}{5000}$ to $\frac{1}{500}$. The

liquor sodæ chlorinatæ, or Labarraque's solution, is diluted with 9 volumes of water. Creolin is used in a 2 per cent. solution in water. The peroxide of hydrogen may be used plain or diluted two to four times with sterilized water. Iodine tincture is employed in 2 per cent. strength; carbolic acid in a 2 to 5 per cent. solution in water.

The obstetrician. Absolute cleanliness must be the watchword of the obstetrician. He should avoid as far as possible contact with pathological material and with contagious diseases and other sources of wound infection. After a septic exposure an entire change of clothing, and repeated and conscientious use of disinfectants is necessary before taking charge of a confinement case. A full bi-chloride bath should be taken, and the hair and beard washed with the same antiseptic solution. When summoned to a case of labor immediately after a septic contact, all internal examinations should, if possible, be avoided. The use of sterile rubber gloves under such conditions furnishes an additional safeguard.

Disinfection of the hands.

1. *Fürbinger method, modified.*

(a) Scrub the hands and forearms for five minutes with green soap and water as hot as can be borne. Special attention must be given to the finger tips and the spaces around the nails. Rinse the hands in sterile water.

(b) Clean nails with a nail-cleaner, either of metal or wood, and soak the hands in alcohol of not less than 80 per cent. strength.

(c) Immerse the hands and forearms for five minutes in a hot solution of mercuric chloride or iodide ($\frac{1}{2000}$ to $\frac{1}{1000}$).

2. *The permanganate method.*

(a) The nails are cut short and carefully cleaned.

(b) The hands and forearms are scrubbed for five minutes with green soap and hot water.

(c) The hands and forearms are immersed for five minutes in a saturated solution of potassium permanganate in hot sterile water. Vigorous friction is applied with a sterile brush until the skin is stained a deep mahogany-brown.

(d) The hands and forearms are now held in a saturated solution of oxalic acid in sterile hot water, until the brown stain is completely discharged.

(e) After rinsing in sterile water the hands are immersed for three minutes in a $\frac{1}{500}$ mercuric chloride solution.

3. *The chlorinated soda method.*

Steps (a) and (b) are the same as in the Fürbinger method.

(c) The hands and forearms are covered with a paste made by melting chlorinated lime with water. They are then rubbed with a lump of crystallized sodic carbonate (washing soda) till a sensation of cold is felt. This process yields chlorinated soda in its nascent state, which is the active disinfectant.

(d) Friction is applied with a hand brush for five minutes, and the hands rinsed in sterile water. After cleansing the hands care must be constantly

observed to avoid contact with anything which is not aseptic. For digital examinations no lubricant is ordinarily required, as the fingers are wet with the antiseptic solution. Sterile vaseline or other lubricant can be easily procured in collapsible tubes.

The patient. The aseptic preparation of the obstetric patient should begin weeks before the labor. Diseased conditions of the rectum, the vulva, or the bladder should, as far as possible, be relieved. If the vaginal discharges are copious, yellowish or greenish in color, and excoriating, active treatment is indicated. Vaginal douches of bichloride solution $\frac{1}{5000}$ twice daily, followed immediately by sterile water to prevent absorption of the mercurial, will materially benefit such conditions, and prevent a possible virulent ophthalmia in the newly-born infant. Under normal conditions ante-partum douching is harmful, as it washes away the natural secretions of the vagina which are germicidal. The normal secretions of the vagina are strongly acid in reaction, while in pathological conditions of the secretions they are feebly acid, neutral, or alkaline. The litmus-reaction furnishes therefore a convenient guide to the conditions in which vaginal disinfection before labor is indicated. At the beginning of labor the patient should have a full bath and a complete change of linen. The lower bowel should be emptied by an enema. The external genitals and the entire lower half of the body are made aseptic. The vulvar hair is clipped short, and a compress

saturated with boric acid solution is applied over the vulva. In hospital practice the lower limbs are enveloped in sterile coverings. It is impossible, however, to lay down rules which alone will make an aseptic practitioner. The obstetrician must be possessed of an aseptic instinct, and this is a matter which comes of training and a keen appreciation of the possible sources of infection.

Appendicitis in Pregnancy. Appendicitis is a rare complication of pregnancy, but one writer has collected fifteen cases with seven maternal deaths. Hirst reports four cases in his own practice. In one case of acute peritonitis in the fifth month of pregnancy, pools of pus were found lying between the coils of intestines, a gangrenous appendix, and two perforations of the caput coli. The pregnant uterus was turned out of the abdominal cavity, the pus carefully sponged out with gauze pads, the appendix amputated, and the perforations in the colon closed by suture. The woman recovered, and the pregnancy was not interrupted. In another case a sharp attack of catarrhal appendicitis brought on labor at the sixth month. In another case the patient was seized with violent vomiting and intense abdominal pain at eight and a half months of gestation. Labor came on a week later; there was a great amelioration of symptoms, but four days later her temperature began to rise and the pulse was accelerated. On opening the abdomen the appendix was found to have sloughed off, and three large abscesses were found in the lower abdomen. The

patient died. Appendicitis in pregnancy, therefore, while a rare condition, appears to be very dangerous to life, unless early operation is done. The operation under favorable conditions has a low mortality, and the chances are about even that the pregnancy will not be interrupted. The medicinal treatment would be the same as in the non-pregnant condition.

Asepsis, *see antiseptis*.

Ascites in Pregnancy. Ascites complicating pregnancy may arise from a lesion of the abdominal viscera interfering with the return circulation. Pregnancy itself may occasion ascites through a pathological condition, which affects the peritoneum of the mother and the amnion of the fetus. Tubercular peritonitis is also a cause of ascites and may complicate pregnancy. The treatment of abdominal dropsy complicating pregnancy is, preferably, by abdominal incision. If a tubercular process be present, great improvement, if not recovery, may confidently be expected. If there is a pathological condition of the lymphatics of the peritoneum, free drainage by incision is the best possible treatment. Ascites from diseases of the heart, kidney or liver can be differentiated by the history of the case, and by special examinations of those organs.

Asphyxia Neonatorum. The respiration of a child immediately after birth is usually somewhat irregular, but within a short time expiration and inspiration take place in a normal manner. Deviations from this natural condition, from slight

difficulty in breathing on account of mucus in the trachea and bronchial tubes to complete apnoea, represent the different grades of asphyxia of the new-born.

(a) *Intrauterine asphyxia.* The causes of intra-uterine asphyxia are: disturbances of the placental circulation, either from constant pressure upon the cord, or severe uterine contractions; premature detachment of the placenta; systemic disease in the mother which interferes with the proper supply of oxygen to the child. In consequence of this interference with the placental circulation an increased amount of CO₂ is present in the child's blood, and efforts at respiration in utero are made. In this way meconium and amniotic fluid are drawn into the respiratory passages, producing suffocation or inducing pneumonia later. Lusk makes the statement that suspended animation in the new-born is, with few exceptions, preceded by intrauterine respirations. He believes that compression of the cord is the most frequent cause. Prolonged pressure on the fetal brain by the forceps or by the pelvic bones is still another cause.

Diagnosis. The important diagnostic symptom of beginning asphyxia is diminished frequency of the fetal heart-beats. This has no significance if it occurs only during the pains, but, if it persists during the interval between pains and be progressive, it is of serious import. The diminished frequency is sometimes succeeded by increased rapidity of the heart beat, indicating paralysis of the pneumogastric nerve. Then follows increased

intestinal peristalsis as evidenced by the evacuation of meconium in a head presentation, and finally muscular spasm and unusual movements of the child. In all tedious and difficult labors and before obstetrical operations the condition of the fetal heart should be carefully observed.

Treatment. The treatment of threatened intra-uterine asphyxia should be directed to the acceleration of the labor in every way consistent with the safety of the mother. During the descent of the head malpositions of the cord must be looked for, and, if possible, corrected.

(b) *Extra-uterine asphyxia.* There are two stages of extra-uterine asphyxia.

1. *Asphyxia livida.* The muscular tone is still preserved. Reflex movements are easily produced by surface irritation. The skin is dusky red or livid, the cutaneous vessels are turgid, the conjunctivæ injected, and the eye-balls protruding. The cardiac and umbilical pulsations are slow but forcible. The umbilical vessels are fully distended. Respiratory movements usually occur only after a certain interval. They are at first feeble, superficial, and attended by facial contortions. The increased deficiency of oxygen after delivery often furnishes to the medulla a stimulus sufficiently strong to cause spontaneous respiratory movements. Irritation of the surface causes the same result. The prognosis of this stage is favorable.

2. *Asphyxia pallida.* An advanced stage of asphyxia in which the child is extremely anæmic. The conjunctivæ are without lustre; the surface is

cold; the sphincters are relaxed; the limbs, head, and lower jaw hang loosely down; reflex movements do not occur; the cardiac beats are frequent and feeble; the umbilical pulsation is almost or quite imperceptible. Either no spontaneous respiratory efforts are made, or they are few and produced by the diaphragm alone without the participation of the facial, nasal, or maxillary muscles. The prognosis of these cases is bad. The grade of asphyxia can be determined by irritation of the palate. If, upon the introduction of the finger to remove the mucus, there are choking and convulsive movements and attempts to breathe, the prognosis is good. If no such symptoms occur, the prognosis is unfavorable.

Treatment. The treatment of asphyxia livida consists in removing all obstructions from the air-passages and the stimulation of the respiratory centre in the medulla. The mucus should be removed from the throat and mouth of the child by the introduction of the little finger followed by mouth-to-mouth insufflation to remove the mucus from the nasal passages. The nostrils should not be held during this procedure. A handkerchief is placed over the child's mouth, and air is forced into the child's lungs. The skin is now irritated by slapping and rubbing, and alternate warm and cool baths are employed. A teaspoonful of blood should be allowed to escape from the cut end of the cord before ligation. These simple measures will usually prove sufficient to excite respiration in cases where the muscular tone is preserved.

The child must be watched very carefully after respiration is once established, as relapses are frequent and usually fatal.

The treatment of *asphyxia pallida* must be more heroic from the first. Of course the air-passages must be cleared of mucus. Reflex irritation is a waste of time in this class of cases. Artificial respiration is the best treatment. If the infant is poorly nourished, the method of *Byrd* or *Sylvester* will give the best results. In the use of *Byrd's* method the child lies upon its back on the palmar surfaces of the operator's outstretched hands. The operator by elevating the radial edges of his hands doubles the child's trunk upon itself—*expiration*. Then by lowering the radial well below the level of the ulnar borders of the hands the child's trunk is thrown into a position of extreme extension—*inspiration*. The advantage of this method lies in the fact that it can be conducted without rough handling of the child. In *Sylvester's* method the child is placed upon its back with the shoulders raised sufficiently to prevent the chin from falling forward on the breast. The tongue is drawn forward. The operator grasps the arms above the elbows, and, raising them upward by the sides of the head, extends them gently and steadily upward and forward for a few moments. The feet should be fixed. Expiration is effected by turning down the arms and pressing them gently, but firmly, against the sides of the chest. When this process has been repeated for a few minutes, the child should be placed in a warm

bath. The temperature of the bath should not exceed 105° F.

The method of Schultze has been extolled by most writers on Obstetrics, but should not be employed at the start in cases of deep asphyxia in which the heart movements are scarcely perceptible. When the heart's action has improved, this method furnishes the best chance of ultimate success. In this method the physician holds the child suspended face to the front, his index fingers in the axillæ, the thumbs resting on the front of the chest and the remaining fingers upon the infant's back. The child is then allowed to hang at arm's length between the knees of the operator. In this position the pectoral muscles draw the superior ribs upward, the abdominal muscles draw the inferior ribs downward, and the weight of the liver causes the diaphragm to descend. The chest is thus expanded and inspiration produced. The child is then swung upward until the arms of the operator reach an almost horizontal position. An abrupt termination of this motion causes the thorax of the child to become stationary, while the lower limbs fall slowly toward the operator and upon the child's abdomen. In this way the chest and abdomen are powerfully compressed, the diaphragm is forced upward, and an efficient expiration results. The child's body is now returned to its original position by reversing the direction of the swing. The entire procedure should occupy from seven to eight seconds and is repeated continuously for two or three minutes. The child is

then immersed in a warm bath to restore the body-heat lost during the swinging movements.

The method of Laborde consists in rhythmical traction upon the tongue eight or ten times a minute. This method may be practiced while the child is in the warm bath.

In many cases after respiration has become established, the use of dry heat by a hot-water bag or other means is necessary, and the cautious use of stimulants is valuable.

In *asphyxia pallida* a rectal injection of water at a temperature of 110° F. is decidedly helpful.

Atelectasis. Closely allied to asphyxia and often associated with it is a persistence of the fetal condition of the lungs affecting portions of one lung or both. The infant fails to completely inflate the lungs. Sometimes it is asphyxiated, and at other times the trouble is shown by rapid breathing and lack of expansion of one or both sides of the chest. The causes of this condition are: natural weakness of the child due to some debilitated condition of the mother, premature birth, etc., rendering the respiratory muscles too feeble to expand the chest; asphyxia and injury to the brain from pressure. Congenital atelectasis is not frequent. The lower lobes are more apt to be affected. The symptoms are those of deficient respiratory action, such as pallor, feeble cry, and poor circulation, with very little expansion of the chest over the affected area. The *diagnosis*, which is usually difficult, often not made during life, must depend upon the rapid, irregular breathing, upon the cyanosis and dulness

on percussion over the affected area. If a large extent of surface is involved and cerebral lesions co-exist, the *prognosis* is unfavorable. If the area involved is small and unattended by cerebral lesions, the prognosis is good.

Treatment. Deep inspiration should be encouraged by artificial respiration. A soft catheter may be passed into the larynx and the lungs gently inflated. The vitality of the child should be maintained by the external application of heat and the judicious administration of nourishment and stimulants.

Auto-Infection. Every obstetrician at the present time believes that the vast majority of cases of infection are the result of the introduction of pathogenic micro-organisms from without. Many, however, still believe that in a certain small percentage of cases the infection results from micro-organisms which were already within the woman before the onset of labor. The term "auto-infection" is applied to such a case. The germs in these cases may come from the vagina, or from an old pyosalpinx, whence they spread by rupture of the tube during labor. A previous endometritis caused by some pathogenic germ may furnish the exciting cause. All bacteriological observers agree that the body of the normal uterus is free from micro-organisms. The normal secretions of the cervix are also sterile. The question hinges, therefore, upon the demonstration of pathogenic organisms within the healthy vagina. A vast amount of bacteriological work has been done to deter-

mine this question, and absolutely uniform results have not been obtained by different investigators. The latest experiments seem to show conclusively that the vaginal secretion, when obtained without contamination from the vulva, is absolutely free from pathogenic bacteria. The majority of American obstetricians do not believe in the possibility of auto-infection through the vaginal secretions.

Baby Clothes. The subject of proper clothing for babies has been very much neglected. It is high time that the profession should seriously consider this important matter and combat the irrational methods so long in use. To Dr. L. C. Grosvenor, of Chicago, is due the credit of an innovation in the dressing of infants which will add materially to the comfort of both mother and child. Dr. Grosvenor advises against the usual bandage around the body and declares that such bands inevitably predispose the child to rupture. The band, if used at all, should be made of the "Arnold" knit fabrics and should be dispensed with altogether when the navel dressing comes off. The "Gertrude" suit, also an invention of Dr. Grosvenor, consisting of three pieces, which can be placed one within the other and all slipped on at once, constitutes a decided advance in the dressing of babies. The main advantages of this method of dressing are:

1. Perfect freedom to all thoracic, abdominal, and pelvic organs.
2. All clothing hangs from the shoulders.
3. The greatest saving of the time and strength of the mother.

4. The resulting health and comfort of the child.
5. The evenness of the covering of the body, there being the same covering over the shoulders as elsewhere.

Baby's Basket. The following articles should be provided for the baby's basket :

- Large and small safety-pins.
- Talcum powder (box and puff).
- Fine, soft sponge.
- Soft brush (for hair).
- Castile soap.
- Cold cream.
- Alcohol for rubbing child.
- Blunt scissors for nails, etc.
- Old linen for cleaning mouth.
- Soft towels for bath.
- Bath-blanket.

Bag, Obstetric. The obstetric bag should be large enough to contain all the instruments and other surgical appliances that may be needed in an ordinary labor. The following articles are absolutely necessary: obstetric forceps; a glass uterine douche tube; a soft rubber catheter; a half dozen needles about two inches in length and straight or slightly curved for suturing the perineum; a few short curved needles for use in the vagina; a needle forceps; sterilized sutures of cat-gut, silkworm gut, and of silk; one or two hand brushes; a yard or two of iodoform or plain gauze; a set of Barnes' bags. The bag should also be supplied with chloroform, ether, carbolic acid and chloral, tablets of corrosive sublimate, Ergot,

and *Veratrum viride*. A Kelly pad is extremely useful, as is also a set of leg holders. A pair of rubber gloves is also advised.

Bags, Barnes'. Barnes' Bags are made of soft rubber in the shape of a fiddle. They are used to dilate the cervix, when artificial dilatation is necessary. These bags usually come in three sizes, but it is advisable to have one still larger than the largest ordinarily sold. To insert one of these bags, it is rolled upon itself, grasped in a strong pair of curetting forceps, well smeared with carbolized vaseline, and passed into the cervical canal, so that the internal os corresponds with the constriction in the middle of the bag. The patient may lie in the lithotomy position, the anterior lip of the cervix being drawn down by a volsellum. One or two fingers are introduced within the vagina and the instrument passed on these as a guide. The Sims position is preferred by many operators. The perineum is retracted by a Sims speculum, the cervix drawn forward, and the os externum readily brought into view. When the bag has been securely placed within the cervix, it is distended with boiled water through the attached tube. A Davidson syringe is used for this purpose, and the operator must know by previous trial how many bulbfuls are required to distend the bag to its limit. When the bag is filled, the rubber tube is clipped with an artery clip. Each of the progressively larger bags is inserted in the same manner and allowed to remain in place from fifteen minutes to an hour, according

to the time at one's disposal. In using any of the rubber dilators it is necessary that the material be new and well preserved, otherwise they will be very apt to rupture when distended. They should be rendered thoroughly aseptic before use.

Ballottement, *see signs and symptoms of pregnancy.*

Bandl's Ring. The ring of Bandl, or the contraction ring, is the boundary line between that portion of the uterine muscle which contracts firmly in labor, diminishing the intra-uterine area and driving the child out of the uterine cavity, and that portion of the uterine muscle which must be distended in labor to allow the passage of the child. The principal importance of this structure lies in its relation to rupture of the uterus. In protracted and difficult labors this band becomes well-marked as a transverse ridge clearly defining the limit between the thinned, stretched lower segment and the thickened, retracted upper portion of the uterus. When this ridge is felt more than half-way from the pubes to the umbilicus, rupture of the uterus is imminent, and the labor should be terminated as speedily as possible.

Basiotribe, Tarnier's. An instrument used in the performance of craniotomy. It is designed to include all the useful features of the perforator, cranioclast, and cephalotribe. It is composed of a perforator in the centre, two blades of unequal length, and a powerful compressing screw. The centre-point is bored through the cranial vault and directly into the base of the skull. When the

head has been thus entered, the blades of the cephalotribe are applied upon each side of the skull, and the cranium thoroughly crushed. Extraction is then performed in the usual manner.

Binder, Mammary. The breast-bandage is exceedingly useful in over-distention of the breasts, and as a support when the breasts are unusually heavy. The best binder for ordinary use is the Murphy binder. It is made of a straight piece of muslin, with a shallow notch cut in one edge for the neck and a deep notch for each arm. The bandage is closely applied over the breasts, the ends being pinned in front.

Binder, Abdominal. The abdominal binder, while not absolutely essential, is useful to steady the uterus, and it promotes the comfort of the patient. The best material is a piece of unbleached muslin, one and one-fourth yards in length and about eighteen inches in width. It must be wide enough to reach well below the trochanters. Unless the binder extends below these bony prominences, it is sure to slip up and give no support. Binders ready made with gores to fit the body offer no advantage. The binder should be pinned from below upward and should be fairly tight. If the uterus shows any tendency to relaxation, one or more folded towels may be placed on the abdomen under the bandage to act as compresses. The binder may be dispensed with after one or two weeks.

“Bleeders,” *see hæmophilia.*

Blood During Pregnancy. The alterations in the blood in consequence of pregnancy affect its quantity and quality. The absolute necessity for a larger amount of blood is self-evident. This increase in quantity occurs largely during the second half of pregnancy. The composition of the blood undergoes marked changes. There is an absolute increase in the white corpuscles, fibrin, and water, and an absolute decrease in red corpuscles and albumen. There is present, therefore, in the body an increased amount of blood of relatively poor quality. To this condition the term serous plethora is applied. Individual variations in the quality of the blood depend upon hygiene and diet. Bad hygienic surroundings and insufficient food reduce the blood to a state of marked chlorosis and hydremia. It is evident that blood-letting is strongly contra-indicated in pregnancy.

Breast, Diseases of.

1. *Sore nipples.* This term includes a number of inflammatory conditions of the nipple varying in severity from a simple erythema to erosions, ulcers, and fissures. The close relation existing between sore nipples and mastitis makes their prompt and appropriate treatment of considerable importance. The injury received during the act of sucking is the primary cause of sore nipples. The delicate epithelium covering the nipple becomes softened and macerated in the child's mouth, and is then readily removed, leaving the papillæ unprotected and liable to infection. The ulceration usually appears from the third to fifth

day after confinement accompanied by very severe pain, and in nervous patients or in the presence of infection the temperature may reach 104° F. or higher. The nervous apprehension and extreme pain may prevent sleep and seriously interfere with the appetite and digestion.

Treatment. Preventive treatment should be instituted in the latter months of pregnancy. The nipples should be washed night and morning with soap and water, followed by inunctions of cacao-butter, lanolin, or sweet oil. Pressure by corsets, or by clothing must be avoided. Astringent preparations designed to harden the nipple are not desirable, as the object should be to render the nipple soft and pliable, rather than tough and inelastic. As soon as lactation begins, the utmost cleanliness of the child's mouth and of the nipple must be secured. The child's mouth should be washed at least once a day with a saturated solution of Boric acid. Before and after each nursing the nipples should be washed gently but thoroughly with the Boric acid solution and carefully dried. If any inflammation of the epithelium appears, a protective ointment should be applied after nursing. The following ointments have proved helpful:

R. Acidi borici, gr. xx.
 Olei ricini,
 Bismuthi subnitratiss, āā 3 ij.

Or, *misig. m. ft. ung.*

R. Tincturæ benzoini comp., gr. xv.
 Olei olivæ, 3 ij.
 Lanolin, 3 vj.

The distilled extract of witch-hazel diluted with three or four parts of water is also useful as a lotion.

When the epithelium is eroded at several points or in one large area, the compound tincture of benzoin, or a 10 grain solution of silver nitrate, painted on with a brush, will often be useful. Powdered tannic acid, dusted on the raw surface and kept in place by a small circular piece of lint smeared with cosmoline, is an effective application. For a distinct and deep fissure the solid stick of nitrate of silver, applied dry, and only to the fissure, is the most efficient treatment. While these measures are being carried out, it is wise to apply a mammary binder, and to relieve pain and prevent further injury to the nipple by the use of a nipple-shield. The shield should be taken apart after nursing, be thoroughly cleansed, and be kept in a tumbler containing Boric acid solution.

Homœopathic remedies.

Agaricus. Nipples itch and burn, look red.

Arnica. During first days of nursing nipples feel sore and bruised.

Borax. Aphthous nipples; contractive pain in left breast when child nurses from the right.

Calcarea carb. Ulcerated nipple, discharging pus.

Castor equorum. Cracked sore nipples, excessively tender; cannot bear touch of clothing; even in neglected cases where the nipple is nearly ulcerated off and only hangs by small strings; areolæ and nipple turn red as in erysipelas.

Chamomilla. Nipples inflamed and tender; can hardly endure the pain of nursing, she feels irritable and cross, with impatience.

Croton tig. Every time the child draws at the nipple a severe pain runs through to the scapula of that side. The nipples are very sore to the touch, but the chief suffering is the pain running to the scapula.

Graphites. Soreness of the nipples, with small corrosive blisters or ulcers, oozing a limpid serum, or a thick glutinous fluid, which forms a crust which is removed by nursing, when the same formation again occurs. Disposition to fissures and cracks.

Hamamelis. Sore nipples where Arnica fails; bleeding nipples; great prostration from nursing.

Lycopodium. Nipples sore, fissured and covered with scurf; the child draws so much blood from the nipples that, when it vomits, it seems to be vomiting blood.

Mercurius. Nipple very raw and sore; sensitive gums, sore teeth, enlarged cervical glands, and other mercurial symptoms.

Phosphorus. Nipples hot and sore; goneness in stomach; much heat in lower part of back across the region of the kidneys.

Phytolacca. Nipples sore and fissured, with intense suffering on putting child to breast; pain seems to start from nipple and radiates over whole body.

Pulsatilla. In mild, tearful patients, who weep at every nursing; the pain extends into the chest,

up into the neck, down the back, and often changes from place to place.

Sepia. The nipples crack very much across the crown in various places, cracks very deep and sore.

Silicea. Nipples ulcerate very easily; pain in small of back while child nurses.

Sulphur. After nursing the nipple smarts and burns. It chaps badly about the base and bleeds. Constitutional symptoms often determine the selection of this remedy.

2. *Congestion and engorgement of the mammary glands*. Engorgement of the mammary glands with milk, accompanied by pain and tenderness and a slight rise of temperature, is not uncommon at the beginning of lactation, and, in fact, throughout the lactation period. Hypersecretion of milk and exposure to cold are the common causes of this condition. The proper treatment consists in removing the excess of milk by more frequent application of the child to the breast, by massage, or by the breast pump. The application of the mammary binder will prevent further engorgement. Homœopathic remedies for this condition are *Aconite*, *Belladonna*, *Bryonia* and especially *Phytolacca*.

3. *Mastitis*. It has been estimated that about one-fourth of all fertile married women suffer from inflammation of the breast at some period of their reproductive activity. This estimate is undoubtedly too high under modern methods of antiseptic care of the nipples and breasts. The disease is more frequent in primiparæ and is rare after the

fourth pregnancy. There are three varieties of mastitis: the *parenchymatous* or *glandular*, the *subcutaneous*, and the *post-mammary* or *sub-glandular*.

Mastitis commonly begins as the parenchymatous variety and approaches the skin-surface of the gland.

The essential *cause* of mastitis is septic infection. Engorgement of milk in the breast predisposes to inflammation, but is not, in itself, a sufficient cause. The infection occurs through the nipple in the majority of cases, although it may enter by the lactiferous tubules or blood-vessels. Impaired general health and local mechanical injuries are important predisposing causes.

The *symptoms* of mastitis are pain, swelling, and localized tenderness in the breast with more or less rise of temperature. A temperature of 104° F. is not uncommon. The disease often begins with a distinct chill. In the glandular variety which is most common there will be found upon examination one or more hard, tender nodules, due to stasis of milk. Infection has occurred, and, unless prompt and efficient abortive treatment is adopted, the inflammation will go on to suppuration.

Treatment. Put the inflamed part at rest by stopping nursing, relieve tension by the use of massage and the breast pump, prevent further engorgement by applying a snug mammary binder, and lessen the blood supply by the application of an ice-bag. Give the indicated Homœopathic rem-

edy. The ice-bag may be kept in place continuously for from twelve to twenty-four hours according to the amount of pain and the height of the temperature. After the pain has disappeared and the temperature has fallen, the ice-bag may be used at intervals for periods of three to six hours until all tenderness disappears. The following Homœopathic remedies will be found of service:

Aconite. When a chill in dry, cold air has been the exciting cause, and a true synochal fever prevails. There is fever, anxiety and restlessness, thirst for cold water, etc.

Belladonna. Breasts feel heavy; there are red streaks running like radii from a central point; she is occasionally chilly; stitches appear and disappear quickly; a dull and stupid feeling prevails; aggravation from jar or jolt.

Bryonia. The breasts have a stony hardness in them; they are hot, hard and painful, but not very red. She feels sick on first sitting up in bed or in a chair, and still worse on standing up. Severe stitching pains in breast, < when lifting arm. Rough, dry lips, thirst and constipation; stools dry, looking as if burnt.

Phytolacca. Particularly when the hardness is very apparent from the start. Very sensitive nipples and breasts which are more or less painful. When child nurses pain goes from the nipple all over the body.

4. *Mammary abscess*. In spite of all precautions and with the best of treatment inflammation of the breast frequently goes on to suppura-

tion and the development of a mammary abscess. The parenchymatous variety approaching and finally involving the subcutaneous connective tissue is most frequently seen. The signs of the presence of pus are not always definite. The symptoms which are suggestive of abscess-formation are as follows: Recurrence of a chill or chilly sensations; greater rapidity of the pulse; persistent temperature; increasing dull pain in the breast; pain upon moving the arm, sometimes with enlargement and tenderness of the axillary glands; diminution in the flow of milk; bluish-red discoloration, with bogginess, adherence, and marked œdema of the skin. Fluctuation is rarely detected until late and should not be awaited. The bluish-red discoloration and the œdema with fever are sufficient to justify an immediate incision. It is dangerous to delay operation until fluctuation becomes evident, as the pus may burrow, forming multiple abscesses, and thus a large portion of the gland be destroyed. The use of an aspirator-needle to detect the presence of pus has been recommended, but it is of doubtful value.

Treatment. The patient should always be anesthetized to open and treat a mammary abscess properly. The skin should be made thoroughly aseptic by the vigorous use of green soap and hot water and a bi-chloride solution. The operator then grasps the breast, and by careful palpation locates the collection of pus. At its most dependent portion and in a direction radiating from the nipple to avoid the milk-ducts a good

free incision is made. After the pus is thoroughly evacuated, the index finger should be passed into the pus cavity, and all communicating and adjacent cavities searched for and freely opened, and all friable tissue broken down. To provide additional drainage a probe may be introduced into the cavity, pushed toward the skin-surface, and then cut down upon. Several such openings may be necessary. After thoroughly dilating all these openings, thorough irrigation with an antiseptic solution is necessary. Peroxide of hydrogen, full strength, followed by electrozone, one to eight, will be found efficacious. Strips of gauze wet with electrozone solution are packed into all the openings. Sterile gauze, absorbent cotton and a firm bandage complete the operation. In twenty-four hours the gauze packing is removed, and the cavities irrigated with peroxide of hydrogen diluted with two parts of boiled water, followed by the electrozone solution. The packing is lightly applied. This treatment is continued until the eighth or tenth day, when the cavities and tracts leading to them will usually be closed. The following Homœopathic remedies are useful in the treatment of mammary abscess and its sequelæ: *Hepar sulphur*, *Lachesis*, *Mercurius*, *Phosphorus*, *Silicea*, *Sulphur*.

Subcutaneous abscess usually follows subcutaneous inflammation of the breast and is due to infection through the lymphatics, the septic material entering through an erosion of the nipple, or directly through a break in the areola or the ad-

jacent skin. Usually the inflamed area is circumscribed. The skin rapidly becomes red, there is fever, and within a few days fluctuation discloses the presence of pus. Many of these abscesses may be prevented by proper care of the nipple. As soon as suppuration is detected, an incision should be made, and the abscess-cavity irrigated and drained as described above.

A diffuse inflammation of the subcutaneous tissue sometimes occurs, which is exceedingly dangerous. It is usually preceded by an erysipelatous inflammation of the skin and is accompanied by chills, high fever, and severe burning pain. The axillary glands are often swollen and tender. The connective tissue quickly suppurates, and the pus burrows in all directions. Unless promptly treated by incision, drainage and thorough antisepsis, extensive sloughing occurs, which may be followed by general pyæmia and death. The author recalls one such case in which amputation of the breast alone saved the patient's life.

Submammary abscess. The submammary variety results from burrowing of pus toward the chest wall. Several pockets of pus may thus be formed beneath the gland. The breast is lifted from the chest by the underlying fluid, the skin becoming tense, but usually not red. The recognition and prompt treatment of this condition is extremely important, as serious consequences may follow before spontaneous evacuation of the pus occurs. The symptoms are not characteristic, as all may be present in parenchymatous abscess.

The absence of marked redness of the skin, and the sensation imparted to the gland by the underlying fluid are the most important signs.

Treatment. The pus should be searched for with a sterilized aspirator needle. Push the breast upward toward the clavicle and thrust the needle deeply beneath the gland on a level with the lower margin of the pectoral muscle. When the pus is located, pass into the cavity a grooved director, which serves as a guide to a pair of dressing-forceps. After the cavity has been thoroughly opened the finger is introduced, and all adjacent pockets of pus are opened, especial care being taken to find and enlarge the opening between the submammary and parenchymatous abscesses. Irrigate, drain, and dress the parts as in the other varieties of mammary abscess.

Cancer of Uterus in Pregnancy. Uterine cancer is, if primary, almost without exception of cervical origin. It is a rare complication of pregnancy, as conception does not readily occur when malignant tumors exist. In the earlier stages of the disease conception is more common. The effect of pregnancy upon cancer is to rapidly increase its growth owing to the increased vascularity of the uterus. Cancer occasionally involves the uterine tissue so extensively that rupture of the uterus results. Abortion and premature labor are frequent in pregnancies complicated by cancer. Placenta previa is frequently found in association with a cancerous cervix. With few exceptions cancer is found in women who have borne many children

before. The symptoms are bleeding, foul discharge and pain. It is not uncommon for pregnancy to be overlooked before the third month in a carcinoma of the cervix.

Treatment. If the condition is operable when discovered, the uterus should be removed by the vaginal route, which is always practicable for the first four months. If the patient is seen for the first time in a pregnancy advanced beyond the fourth month, delay may be advised in the interest of the child. Cancerous infiltration of the tissues of the cervix often necessitates multiple incisions at the time of confinement. In cases where the cervix alone is involved, the diseased tissue should at once be removed as thoroughly as possible by the knife and cautery. Abortion does not necessarily follow, and the child's life may be saved.

Caput Succedaneum. An œdematous swelling that develops on the presenting part of the child as the cervix expands. The size of this swelling varies with the duration of the labor. On the scalp the position of the swelling serves to indicate the position in which the head enters the pelvis. The tumor is located on that end and side of the head opposite in name to the position. Thus in the left occipito-anterior position it is located on the right side of the head posteriorly. There are several other enlargements formed upon the head of a child which must be differentiated from caput succedaneum. Among these conditions are cephal-hæmatoma, hernia cerebri, meningocele, encephalocoele, and hydrencephalocoele. The prognosis in

caput succedaneum is always good. If left alone, it entirely disappears within a short time.

Carus, Curve of. A term formerly used to indicate the direction of the pelvic canal. It is now recognized that the curve of the canal depends upon the curve of the anterior surface of the sacrum which varies greatly. A line parallel with the sacral curve and equally distant at all points from the pelvic walls may be considered for all practical purposes as the axis of the pelvis.

Caul, the When the membranes are preserved unruptured until the head is born, the child is said to be born with a "caul." Such a child is deemed exceptionally lucky by the ignorant, and the "caul" is very carefully preserved as a family heirloom.

Cephalhæmatoma. A soft, elastic, fluctuating tumor situated upon one of the cranial bones. Two or three days after birth, as a rule, a swelling develops, rapidly increasing in size, possessing the physical signs of a cystic tumor, distinctly confined by the boundaries of one of the cranial bones. Usually single, it may be bilateral. The term, cephalhæmatoma, should be confined to those cases where the collection of blood is upon the outside of the cranial bone. It is due to a sub-pericranial hemorrhage which lifts the pericranium from the bone. The cause in the majority of cases is pressure upon the cranial surface by the cervix uteri. As it has occurred in breech births, there is probably a tendency on the part of the blood-vessels to rupture in such cases. The tumor usually

appears upon a parietal bone varying from the size of a hazlenut to that of an apple. It may extend to include the surface of the entire cranial bone, but never crosses a suture or a fontanelle. There is no discoloration of the skin, no fever, nor increase in the pulse rate. The greatest size of the tumor is reached at the end of a week; it remains stationary for a few days and then gradually diminishes in size, until it disappears at the end of from four to ten weeks. The diagnosis is not always easy. Caput succedaneum is differentiated by its presence at birth, its rapid subsidence after birth, and its boggy feel. Hernia cerebri occurs along the line of a suture or near a fontanelle; there is no fluctuation, but usually a pulsation synchronous with the heart-beat. Cries and agitation of the child cause a hernia cerebri to enlarge; not so with a cephalhæmatoma. A vascular tumor on the scalp has the same boggy feel as a caput succedaneum, but it never fluctuates, and the skin covering it is usually discolored. The process of repair in cephalhæmatoma is very interesting. After four or five days from its first appearance a small, hard ridge may be felt where the swelling joins the cranial bone. The production of new bone has begun as the resorption of blood occurs. A thin crust or shell of bone gradually forms over the swelling. This crust will sometimes crackle like parchment. The blood and serum is gradually resorbed, and complete repair ensues without any induration or thickening.

Treatment. Non-interference is the treatment,

unless there are signs of inflammation or of supuration. If suppuration occurs, incision and drainage are necessary, but septic meningitis is apt to develop. The prognosis of cephalhæmatoma is excellent, if no general systemic disease co-exists.

Cephalotribe. An instrument invented by Baudelocque to supersede the perforator. It is essentially a powerful compressing forceps which crushes the head before extracting it. It differs from the cranioclast, which has one blade inside and the other outside the skull. The blades of the cephalotribe are applied outside the head like those of ordinary forceps. The cranioclast is a more useful instrument, and the cephalotribe is now rarely used.

Cervix, Changes in During Pregnancy.

The cervix uteri participates in the hypertrophy of the entire uterus in consequence of pregnancy. Its development is completed at the fourth month, and its increase in size is due more to loosening of its structure and serous infiltration than to new formation of tissue. The hyperæmia and serous infiltration causes a softening of the cervix which proceeds from below upward as pregnancy advances. The mucous follicles of the cervical mucous membrane furnish a thickened secretion, which fills the cervical canal and forms what is known as the "mucous plug." As pregnancy advances an apparent shortening of the cervix occurs, at first confined to the vaginal portion, but afterward involving the entire organ. It was formerly sup-

posed that a gradual unfolding of the cervix takes place, thus contributing to the enlargement of the uterine cavity. Post-mortem examinations have established the fact that the cervix uteri maintains its length of one inch to the last days of pregnancy. The apparent shortening of the cervix is due, in large measure, to the swelling of the vaginal mucous membrane.

Cervix, Dilatation of. The active agents in causing dilatation of the cervix are:

(1) Contraction of the longitudinal fibres of the uterine body, pulling the cervix up over the ovum; (2) hydrostatic pressure of the bag of waters; (3) wedge-action of the presenting part; (4) softening of the cervix. The initial stages of dilatation of the os depend upon the relative weakness of the lower uterine segment and the character of the uterine contractions. The action of the uterine muscular fibres is exerted in two directions, one circular and the other longitudinal. The circular fibres tend to keep the os closed by their contractions, while the longitudinal fibres tend to open the os by drawing its margins apart over the contained ovum. The contractions of the uterus, however, are peristaltic, beginning at the fundus and passing downward to the cervix. The circular contraction is intermittent, while the longitudinal strain is nearly constant. As a result the longitudinal forces gradually overcome the resistance of the circular forces, and the dilatation of the os begins. After the dilatation has proceeded sufficiently, the membranes bulge through the

circle of the os, and the hydrostatic pressure of the bag of waters rapidly facilitates the process of dilatation.

Cervix, Laceration of. Laceration of the cervix to a greater or less extent occurs in all primiparæ and in some multiparæ. It is only when these tears are excessive that they demand treatment. The laceration may be accompanied with severe hemorrhage. The anterior lip of the cervix may be caught between the fetal head and pubic arch, and may be torn off more or less completely. The cause of the more extensive cervical lacerations is, in the majority of cases, an obstetrical operation, at a time when the cervix is not sufficiently dilated to allow an easy passage of the fetus. The symptoms of an extensive laceration of the cervix are often obscure. Intense pain may be present when the tear extends upward through the vault of the vagina. Hemorrhage is the usual symptom which attracts attention. A post-partum hemorrhage with the uterus firmly contracted demands close inspection of the lower portion of the genital canal. If the bleeding does not come from the vulva or vagina, it must come from the cervix.

Treatment. Avoid obstetrical operations, if possible, before full dilatation of the cervix. Do not give *Ergot* until the uterus is empty. Hot water injections or direct compressions may check the hemorrhage, but sutures to close the tear are preferable. The cervix is drawn down to the vulva with a volsella, and the sutures applied. The objection to sutures, unless the attendant is a

skillful operator, is the increased liability to septic infection. The general practitioner can safely check the hemorrhage by inserting a tampon of sterile gauze in the form of a half ring into the lateral vault of the vagina.

Cesarean Section. The operation known as Cesarean section consists in the removal of the fetus from the mother through the abdomen after incising the uterus. In olden times the operation was performed only after the death of the mother. The first recorded Cesarean section upon a living subject was performed in Europe in the year 1610. Until recent years the mortality from the operation was so high that it was practically abandoned. With the improved technic of abdominal surgery at present the mortality of Cesarean section has been brought down as low as 5 per cent. This low mortality rate applies only to selected cases in the hands of skilful operators.

Varieties of Cesarean Section. The Porro operation combines a complete removal of the uterus with the ordinary Cesarean section. The stump is fixed in the abdominal wound and treated extra peritoneally. This improvement reduced the mortality one-half by the prevention of leakage through the uterine wound into the abdominal cavity. The Müller operation depends for its success upon a long abdominal incision through which the womb is delivered before it is incised. This procedure prevents the soiling of the peritoneal cavity by liquor amnii and blood. The Säger operation consists in the closure of the

uterine wound by a double layer of sutures and the retention of the organ.

The indications for Cesarean section are *relative* and *absolute*. The indication is absolute when it is impossible to extract the child, either living, dead, or mutilated, through the natural passages. Extreme degrees of pelvic contraction, foreign growths obstructing the pelvis, cicatricial contraction of the vagina, and carcinoma of the cervix and of the rectum furnish examples of absolute indications for the operation. By a relative indication is meant a condition that admits of some other method of delivery, but in which the question arises whether Cesarean section will not give the best result. A conjugate diameter of 6 to 8 centimeters (from $2\frac{1}{8}$ to $3\frac{1}{8}$ inches), and tumors of the pelvis or of the soft parts causing moderate obstruction are the commonest relative indications. The alternative operations are symphyseotomy, forceps, version, and craniotomy. The operation should be an elective one, and the best time to operate is four or five days before the expected date of labor. By operating in this way the patient is thoroughly prepared for the operation; and the operator can proceed with deliberation with all the advantages of good light, trained assistants, etc. The patient should be prepared for the operation in the usual manner for a celiotomy. The instruments required are scalpels, strong scissors, hemostatic forceps, needles and a needle-holder, sutures of catgut, silk and silkworm gut, a piece of elastic cord

or tubing, a sharp curette, and a thermocautery. There should be provided also a plentiful supply of aseptic towels, sponges, gauze, and boiled water, both hot and cold. After the patient is anesthetized, the vagina should be thoroughly cleansed by scrubbing with green soap. It is then irrigated with 10 per cent. solution of creolin. With a large scalpel held firmly in the full hand a free incision is made through the abdominal wall. The length of the incision depends upon the method adopted by the operator. Some make a long abdominal incision and turn out the uterus before opening it. Others make a much shorter incision, open the uterus, and extract the child before turning the uterus out of the abdominal cavity. By the first method time is saved, and fluids are more readily prevented from entering the abdominal cavity, but the long incision necessitates an extensive scar with consequent weakening of the abdominal walls, and also extensive adhesions between the uterus and the abdominal wall. The shorter incision need not exceed 6 inches, extending from a point about $1\frac{1}{2}$ inches below the umbilicus to a point $1\frac{1}{2}$ inches above the symphysis. The peritoneum is incised in the usual way by raising two portions with forceps, and, introducing the finger as a guide, cutting through the remainder with a strong pair of scissors. The uterus is now in view and an elastic ligature is passed over the fundus and placed around the lower segment of the uterus. The two ends are held by an assistant, who makes

traction, compressing the uterus and fixing it against the symphysis. The uterus is incised from the fundus to a point just short of the retraction ring. An opening is made just above the lower uterine segment, and the incision is enlarged upward by means of scissors. If the placenta lies in the way, the edge is detached and pushed to one side. The assistant now presses the abdominal wall toward the sides of the uterus and the operator grasps the child by the extremity lying nearest the incision and extracts as quickly as possible. Two clamps are quickly applied to the cord which is cut between them, and the child handed to an assistant. The hand is now passed into the uterus and grasps the fetal surface of the placenta. The fingers are then closed upon it, squeezing it like a sponge. In this way the placenta is freed from its uterine attachment and gradually withdrawn, the membranes peeling off from the uterine wall. Usually by this time the hemorrhage is comparatively slight. Should there be much hemorrhage it may be temporarily controlled by tightening the elastic ligature. The uterus should now be stimulated to contract by friction, by irrigation with hot water, and by the application of hot towels. The injection of a half drachm of *Ergot* immediately before the abdominal incision is a wise precaution. When the uterus is well contracted it is lifted out of the abdominal cavity and laid upon a large piece of sterilized gauze, which also serves to prevent protrusion of the intestines. It is the practice of some operators to

sprinkle about 8 grains of iodoform powder into the uterine cavity before the sutures are placed. The uterine incision is now closed with a row of deep silk sutures. These sutures pass from the border of the incision diagonally down through the muscular coats to the junction of the decidua and the muscular layer. They are then brought out and entered on the opposite surface of the wound at corresponding points and brought out on the peritoneal surface of the uterus. If there is still hemorrhage, these sutures are tied immediately after their introduction, until the bleeding is controlled. Each suture is tied firmly enough to bring the surfaces snugly together and to stop hemorrhage. The deep sutures are now completely covered in and concealed by a layer of superficial sutures along the whole length of the wound. Fine silk may be used for these sutures. Each suture is made to enter and emerge on the peritoneal surface just outside the line of the deep sutures, and includes just enough tissue to secure a firm hold. The suture is then carried across the incision and through a fold of peritoneum on the opposite side. The peritoneum is thus drawn over the deep sutures, forming a barrier against infection. The uterus is now drawn forward, the gauze removed, and the abdominal cavity carefully dried with cheese-cloth sponges. The uterus is then replaced in the abdominal cavity and the abdominal wound is closed in the usual manner. The usual antiseptic dressings are applied and held in place by a suitable bandage.

After Treatment. It may be necessary to give the patient one or two hypodermic injections of morphine the first night. This procedure will not be necessary after twenty-four hours. The child should be put to breast after twenty-four hours, and subsequently at the regular interval of two hours. The bowels should be moved on the third day. The patient should be allowed to urinate as soon as she is able, and after each urination the parts should be cleansed with *Boric acid* solution. After two weeks the patient may be lifted out of bed and allowed to remain in a reclining posture for a short time each day. During the third week she may sit up for a portion of the day, and during the fourth week may begin to walk. An abdominal bandage should be worn for several months.

The Porro Operation. The Porro operation is indicated: (1) When the labor has been prolonged and manipulations have been undertaken which make the occurrence of sepsis very probable. (2) When the uterus or appendages are diseased to such an extent that a subsequent operation will certainly be necessary. (3) When tumors are present in the pelvis or vagina, or cicatricial contraction of the vagina exists, rendering the delivery of a child impossible, it is justifiable, with the consent of the patient and her relatives, to prevent the recurrence of pregnancy. The technique of this operation is precisely the same as in the Sanger operation, until the uterus has been turned out of the abdominal cavity. The elastic

ligature is now placed around the lower uterine segment and tied tightly to control the circulation. A pad of gauze is drawn behind the fundus to prevent infection of the abdominal cavity. After the uterus has been evacuated as described, the portion of the uterus above the ligature is rapidly cut away, and the tubes and ovaries removed. The stump of the uterus is carefully disinfected with pure *Carbolic acid* and cauterized. The abdominal wound is now closed down to the stump, which is securely fastened into the lower angle of the wound by two sterilized knitting needles passed transversely through the stump and the rubber ligature. The needles rest upon pads which protect the abdomen. Iodoform gauze is packed in and around the stump, and *Iodoform* and *Boric acid* powder (1 to 8) is used freely. Thick pads of sterile gauze are laid over the incision, over these cotton, and then the bandage. This dressing is left undisturbed for several days, unless hemorrhage occurs, or the temperature begins to rise. If the dressings become moist, they must be removed, the stump thoroughly disinfected, sloughs removed, and fresh dressings applied. The stump sloughs away in from ten to fifteen days, leaving a large granulating surface, which is sometimes slow to heal.

Prognosis of Cesarean Section.

Under the most favorable conditions the mortality of Cesarean Section is from 5 to 10 per cent. In private practice the mortality is considerably higher. The prognosis for the child is good; 90 to 95 per cent. of the children are saved.

Chloral in Labor. *See Anesthesia in labor.*

Cholera During Pregnancy. Cholera during pregnancy is exceedingly dangerous to the child. The prognosis for the mother is as good as in the non-pregnant condition. The patient is usually taken ill at midnight or early in the morning, and, if the symptoms of collapse partially disappear, a typhoid state frequently develops with active delirium, followed by deep coma. During the coma the pulse is strong, dicrotic, and the respiration irregular. Hemorrhage into the conjunctivæ is often present. The fetus usually dies during the stage of intoxication, and is expelled in the stage of typhoid delirium. Instrumental delivery is frequently necessary. The treatment is the same as in the non-pregnant state. No attention should be paid to the pregnant condition, other than to complete labor as soon as possible when it begins, and to secure good uterine contractions during and after the labor.

Chorea During Pregnancy. Chorea is a comparatively rare complication of pregnancy occurring mainly in primiparæ with an hereditary predisposition. Cases of chorea in pregnancy may be true chorea, hysterical chorea, or a mixture of both. The great majority of cases begin in the third or fourth month of pregnancy. Acute rheumatism, or a distinct rheumatic taint, is the usual predisposing cause. Epilepsy and other disorders of the nervous system predispose to chorea. Fright, emotion, and profound anæmia favor its occurrence. The causes of the actual outbreak of

choreic symptoms are an hysterical predisposition to nervous excitability, a depleted condition of the blood, and the beginning of fetal movements. Post-mortem examinations show that in severe cases the motor cortex of the brain, the intellectual centres, and the spinal cord are all involved. In mild cases the motor cortex alone is affected. In mild cases the pregnancy is not interrupted, while in severe cases abortion occurs, followed not infrequently by fatal termination from coma and high temperature. Severe cases, which do not end fatally, may result in mania persisting for a considerable time. The earlier in pregnancy the chorea begins, the greater is the danger to the fetus. After the delivery choreic movements still continue, gradually lessening in intensity until they finally disappear. Pregnancy predisposes greatly to the recurrence of chorea, so that a girl who has been choreic in early life will almost surely develop chorea during pregnancy. The diagnosis between hysteria and true chorea is not always easy. The movements in hysteria are more sudden and occasionally rhythmic in character. Impairment of sensation is a prominent symptom in hysterical cases, and a history of hysteria may sometimes be obtained. During pregnancy chorea is usually bilateral in its manifestations. The countenance of the choreic patient shows listlessness and vacancy, and peculiar grimaces when the facial muscles are affected. Mental apathy and general relaxation of the muscular system are often present. The face is usually affected. Speech and the

movements of the tongue are involved in severe cases. The memory is often affected. Patients who become maniacal after chorea often give utterance to a peculiar cry. The analogy between this cry and that of the epileptic patient is interesting. As regards the influence of chorea upon labor, the choreic movements often cease when labor-pains begin; the labor itself is often normal. There is a temporary decrease in the choreic movements after the birth of the child, followed by increased activity as efforts are made to expel the placenta. After the completion of labor there is usually an increase in the movements about the third or fourth day. The irritation of nursing is apt to have an unfavorable effect. Endocarditis is observed as a complication in a considerable number of cases and makes the prognosis more serious. Anæmia of a high grade is common, giving rise to murmurs at the base of the heart. The urine shows an excess of urea and phosphates. Delirium, acute mania, and delusions may complicate chorea during pregnancy. Children born of choreic mothers sometimes show marked tendency to convulsive movements.

Treatment. The chorea of pregnancy does not yield as readily to treatment as the ordinary form. As anæmia is so frequently present, highly nutritious food is necessary, and *Iron*, either alone or in combination with *Arsenic*, will prove beneficial. In severe cases when the movements are very violent and threaten to bring on labor, do not hesitate to give the patient 10 grains of Chloral

with 10 grains of Bromide of Sodium every 6 hours, until quiet and rest is secured. In milder cases the hypnotics like Veronal, Sulphonal, Trional or Chloralamid may prove helpful in procuring sleep. The patient should be kept in bed, should be free from annoyance and excitement, and put upon a carefully chosen diet. It is often necessary to protect the patient's skin from friction, caused by the severity of the movements. If the chorea be slight or of the hysterical form, the pregnancy should not be interrupted. In severe cases it is frequently necessary to induce labor. The following conditions call decidedly for the interruption of the pregnancy; threatened exhaustion of the mother from the intensity of the movements and loss of sleep; when mania or fixed delusions are present; when a severe complication like endocarditis exists. So far as the obstetric treatment of these cases goes, hemorrhage after delivery should be guarded against, and it should be remembered that the debilitated condition of the patient renders her especially liable to septic infection.

The *Homœopathic* remedies for chorea during pregnancy are the same as for the ordinary form of the disease.

Chorion, Diseases of. The only disease of the chorion which requires description is *hydatiform degeneration of the chorionic villi*. The villi of the chorion occasionally undergo myxomatous degeneration. The resulting product is known as a vesicular mole. The mole is a mass of vesicles re-

sembling grapes or gooseberries. The vesicles vary in size and may number five or six thousand. They contain a fluid usually colorless, transparent, liquid like water, holding albumin in solution. If all the villi of the chorion are affected, the ovum necessarily dies. If only a small portion of the villi are involved, development to term may proceed. The condition is a rare one and found most often in multiparæ. The *cause* of vesicular mole is supposed to be a previous endometritis. The symptoms are: first, an abnormally rapid increase in the size of the abdomen; second, uterine hemorrhage; and third, the discharge of the vesicles through the vagina.

Treatment. As soon as the hemorrhage occurs and the discharge of the characteristic vesicles makes the diagnosis clear, the uterus should be dilated, thoroughly emptied, and very carefully everted. The application of compound tincture of *Iodine* at intervals of two or three days is a useful procedure to prevent a possible recurrence in subsequent pregnancies.

Clothing in Pregnancy. The clothing of the pregnant woman should be so adjusted that undue pressure upon the chest and abdomen is avoided. Corsets should not be worn. The heavier clothing should hang from the shoulders, and not from the waist. Pressure upon the abdomen favors the development of albuminuria and uræmia. Circular garters should be replaced by side-supporters. Multiparæ with lax abdominal walls often require a suitable supporter to render

them comfortable. Such a supporter should exert a lifting rather than a constricting pressure.

Colostrum. The mammary secretion of the first days after delivery, before the true milk secretion is established, is known as colostrum. It is a turbid, watery fluid, of a faint lemon-yellow color, and is richer in fat, sugar, and the inorganic salts than the fully-developed milk-secretion. Colostrum is poor in casein and rich in albumin, and, therefore, unlike, milk coagulates on boiling. Colostrum is an imperfect emulsion, its fat-drops being of unequal size and adhering to one another. The so-called colostrum corpuscles are agglutinated fat globules. The laxative action of colostrum has been attributed to its high percentages of inorganic salts, and the large proportion of fat and milk-sugar in its composition. Others assert that its indigestible nature accounts for its laxative effect.

Constipation in Pregnancy. Constipation is exceedingly common in pregnancy, and is caused partly by the pressure of the uterus upon the upper portion of the rectum. A deeper acting cause is deficient innervation of the muscular coat of the bowel increasing the normal intestinal torpor of women. The results of constipation are mental dullness, dizziness, distended veins, headache, and loss of appetite. Hemorrhoids, or prolapse of the rectum, may occur as a result of constipation. It is even possible that large accumulations of feces in the colon may irritate the uterus to such an extent that abortion may result.

Treatment. A proper regulation of the diet is highly important. The use of fruits, coarse cereals, and an abundant quantity of pure water, especially at bed-time and on rising in the morning, is helpful. Exercise in the open air, and a regular hour for evacuating the bowels, are essential points of treatment. In the medical treatment of the case active purgatives should be avoided, as their secondary effect always increases the constipation, and they have been known to produce an abortion. In neglected cases repeated enemata of sweet-oil and ox-gall may be necessary to unload the rectum, or even the mechanical use of the spoon, followed by enemata. Simple laxatives are usually sufficient to keep the bowels active, if proper dietetic measures are adopted. The fluid extract of *Cascara sagrada* is a favorite laxative with many physicians. The indicated Homœopathic remedy will relieve a certain proportion of cases, but the constipation must not be allowed to continue for any length of time without effective relief.

Contraction Ring. See *Ring Bandl's*.

Cranioclast, the. A powerful craniotomy forceps, one blade which is passed into the cranial cavity through the opening made by the perforator, while the other grasps the head outside.

Braun's cranioclast is the best instrument. This instrument is made entirely of metal, with a cephalic curve to the blades, and the shanks and handle so long that the lock is entirely outside the vulva. The blades consist of a larger or outer

blade, fenestrated and grooved, and a smaller or inner blade, solid and supplied with ridges which fit into the grooves upon the outer blade. The cranioclast is intended as a tractor alone, but may also be used to break up portions of the skull beneath the scalp previous to extraction. This instrument is sufficient in most cases requiring craniotomy, unless it is necessary to crush the base of the skull.

Craniotomy. The terms Craniotomy and Embryotomy are used to designate all destructive operations by which the volume of the foetus is reduced in order to permit delivery. Craniotomy means mutilation of the head; Embryotomy, mutilation of the trunk. The operative procedures are as follows:

Upon the head: *Perforation, cranioclasia, cephalotripsy, basiotripsy.*

Upon the neck: *Decapitation.*

Upon the trunk. *Evisceration or eventration.*

Indications. The fact that the child is dead must first be determined. Embryotomy upon a living child should only be considered under very exceptional conditions. In the minor grades of dystocia the choice lies between craniotomy and symphyseotomy; in the major, between craniotomy and Cesarean section. Cesarean section done as an elective operation should not show a greater mortality than 10 per cent. When done as a last resort, after ineffectual efforts to deliver by forceps or by version, the mortality is much higher. Under such circumstances craniotomy is

safer for the mother. Embryotomy upon the dead fetus is demanded whenever the extraction of the child, undiminished in size, would increase the dangers to the mother.

The ordinary indications for Embryotomy are as follows:

(1) Moderate degrees of pelvic contraction, where forceps or version is impossible, or is dangerous to the mother.

(2) In contracted pelves with a transverse diameter at the inlet of at least 3 inches and a conjugate diameter but little under $2\frac{5}{8}$ inches.

(3) Monstrosities, such as hydrocephalus.

(4) Impaction of the presenting part as in locked twins, or in some face presentations.

(5) When the mother's condition demands rapid delivery, and the absolute condition for Cesarean section is absent.

Operation. Strict attention to antisepsis is absolutely essential to success, since the maternal soft parts are so liable to be wounded, and the danger of septic infection is thereby greatly increased. The bladder and the rectum should be empty, and the vulva and vagina thoroughly cleansed by an antiseptic solution. The patient is placed in the lithotomy position, and an anesthetic given. The head is held steady by supra-pubic pressure, or a strong volsella forceps. Two fingers of the left hand inserted through the cervix act as a guide to the perforator. The perforator is then passed along these two fingers to a suture or fontanelle. The point of the perforator is then

carried slowly and cautiously by a twisting or boring movement through the fetal skull. After the perforator has entered the skull as far as the shoulders of the instrument, it should be twisted about several times to enlarge the opening. The blades also may be separated by compressing the handles. The perforator is then carried into the skull and twisted about in every direction to break up the brain, so that it may be removed more easily. The cranial contents are then washed out by means of a flexible tube, or catheter, attached to a fountain syringe. Wash out the brain substance as thoroughly as possible, using sterile water or a weak antiseptic solution. If perforation and evacuation of the cranial contents do not sufficiently reduce the size of the fetal head, it is necessary to employ the cranioclast. In vertex presentations it is best to perforate toward the occipital end of the head. In face presentations perforate at the root of the nose through the frontal bone. In case it is necessary to perforate the after coming head, the best procedure is to introduce the perforator through the floor and roof of the mouth and then through the hard palate. In some cases it is necessary to perforate through the occipital bone and deliver the head by extension, but this should be avoided if possible.

Cranioclastis. This operation involves the use of the cranioclast as a tractor after perforation. To render the operation successful the pelvis must not be so greatly contracted that the trunk will not pass. A conjugate diameter of over $2\frac{1}{2}$ inches is

necessary at full term. The application of the cranioclast is not difficult. For proper application on the left side of the pelvis the instrument must be reversed and held with the lock downward. After perforation and washing away of the brain, the scalp is seized with strong volsella forceps and held by an assistant. Two fingers of the left hand are then introduced to the margin of the opening in the fetal skull, and the inner or solid blade of the cranioclast is passed into the opening. The outer or fenestrated blade is then passed between the skull and the wall of the parturient canal, two fingers of the right hand acting as a guide. The handles are now taken one in each hand and the lock adjusted. Compression is made by the screw on the handle. Traction is now cautiously made in the axis of the pelvis, and, if no slipping occurs, the amount of traction is gradually increased so as to cause the perforated skull to mold itself to the shape of the pelvis.

Curettage. This operation is necessary in cases of incomplete abortion, when portions of the ovum or placenta are retained, and after delivery at term when septic symptoms have appeared as a result of retained membranes or pieces of placenta. The patient is placed in the lithotomy position with the hips drawn well over the edge of the table. The vulva and adjacent parts are thoroughly scrubbed with green soap and hot water, and afterward with sublimate or lysol solution. The vagina is cleansed in the same way and thoroughly douched. Ether is the preferable

anesthetic, especially if there has been much hemorrhage. A weighted, self-retaining speculum is inserted, and the cervix seized with a pair of volsellum forceps. Little traction should be made, as the object desired is simply to steady the uterus. The os is then dilated, if necessary, with a steel dilator. The size and position of the uterus should be carefully determined before the introduction of the curette. Great care should be taken in passing the curette to the fundus, as the uterine wall is usually thinned and softened, and perforation is to be feared. The downward strike of the curette may be moderately firm. The anterior, posterior, and lateral walls should be carefully scraped, paying especial attention to the cornua. A peculiar grating sensation warns the operator that he has reached the uterine wall. The choice of the dull or sharp curette depends upon the condition present. Both may be necessary to attain the desired end. After the curettage is completed the uterine cavity is freely irrigated. It is not necessary to pack the uterus or vagina, unless severe hemorrhage ensues. Curettage should not be repeated in septic cases after delivery at term.

Death of the Fetus in Utero. The symptoms of death of the fetus *in utero* are as follows: (1) The uterus ceases to grow or diminishes in size. (2) Subjective symptoms of pregnancy gradually disappear. (3) The milk secretion appears. (4) The fetal heart sounds and movements disappear. (5) The scalp of the fetal head becomes soft and flabby and the cranial bones are loose and movable. (6)

Diminution of temperature in the cervix uteri. (7) Absence of pulsation in the umbilical cord, if it can be felt. (8) A feeling of languor and depression with impaired appetite in the mother, associated with a feeling of weight in the abdomen, with a fetid discharge from the vagina. These signs are uncertain and not likely to occur, so long as the membranes are unruptured. If the fetus dies during the first months of gestation and the ovum is not expelled, all traces of the embryo may disappear after several weeks. Complete absorption of the embryo is doubtful. It is probable that the embryo has either escaped unnoticed, or has become liquefied. After the fourth month the fetus is either retained without change or exhibits one of the following changes: (1) Maceration; (2) Saponification; (3) Mummification; (4) Putrefaction; (5) Suppuration; (6) Calcification.

Maceration is the most common change after the fifth month. The skin loses its physiological activity, the protective vernix caseosa disappears, and the liquor amnii produces maceration. The fetus is usually discolored, brownish and livid. Here and there the epidermis has desquamated, leaving glistening red spots. All the tissues are softened and on the verge of disintegration. The umbilical cord is dark and has lost its normal spiral aspect. The liquor amnii is discolored from the absorption of the products of decomposition. It may be reddish, greenish, or brownish in color, and may have an offensive odor. *Saponification*

consists in a chemical change by which the fetus becomes fatty or soapy and has a characteristic greasy feel.

Mummification is the typical change in a dead fetus which has attained the age of several months, provided the membranes are unruptured. The fetus is dry and shriveled in appearance, of a grayish-yellow color, and leathery consistency. If the fetus has been subjected to pressure for some time, it becomes dessicated and flattened like a sheet of paper. Such a change is expressed by the term *fetus papyraceus*. The amniotic fluid is lacking, having been absorbed by the chorion or drained off. The fetal appendages are dried and tough and show some fatty degeneration. Mummification is more apt to occur in cases where the cord is twisted around the neck of the fetus.

Putrefaction does not occur so long as the membranes remain intact. In this process the soft parts disintegrate, while the bones either ulcerate through the overlying structures or are removed by surgical means. As a result of putrefaction a foul odor develops, and in some cases a considerable amount of gas is present in the uterine cavity. To this latter condition the term *physometra*, or *tympanites uteri*, is applied. *Suppuration* is often associated with putrefaction. *Calcification* consists in the deposition of lime salts in the fetal tissues and the consequent formation of the "stone child" or lithopedion. Cases are on record in which this condition has existed for years, the petrified fetus remaining *in utero*.

Death in Labor. Sudden death during labor may occur from a variety of causes. The predisposing causes, independent of pregnancy, include valvular heart disease, rupture of a diseased aorta, hydropericardium, fatty heart, pulmonary embolism, hydrothorax, rupture of the spleen, and cerebral apoplexy. In consequence of pregnancy, death may result from eclampsia, uterine hemorrhage, as from placenta previa, early detachment of placenta, rupture of the uterus, or of varicose veins in the broad ligament, entrance of air into veins, and from shock. In these cases of sudden death of the mother the child should be delivered at once. Less than one-tenth of the children thus delivered after the mother's death survive, but immediate delivery should always be undertaken. The child should be delivered through the natural passages, if in any way possible. Multiple incisions of the cervix should be made to hasten delivery, if the os is insufficiently dilated for immediate delivery. Spontaneous expulsion of the child may occur after death of the mother. The force causing such expulsion is obtained from the gases arising from decomposition, accumulated in the abdominal cavity.

Death, Sudden, in the Puerperium.

The causes of sudden death in the puerperal state are embolism, entrance of air into the uterine veins, and heart failure, due usually to organic disease. Pulmonary embolism after delivery may be attributed in part to a uterine thrombosis, but a thrombus in either a femoral,

iliac, or crural vein is doubtless the remote cause. Embolism may result from severe spells of coughing, assuming an upright posture, laughing, straining at stool, etc. The detachment of a portion of a thrombus does not necessarily depend upon such exertions. The clot of blood is often very friable, especially in septic cases. When a large-sized thrombus obstructs the pulmonary artery, death is usually instantaneous. In a less severe type death may be preceded by precordial oppression, great fear of impending death, extreme dyspnoea, cyanosis, and a rapid loss of body heat. The heart's action is violent, with a small, rapid, and irregular pulse. In other cases, if the embolus is small, the symptoms do not appear so suddenly and are not so severe. Death may not occur for several days, and very rarely recovery occurs. Premonitory symptoms, such as sudden diminution in the volume of a milk leg, pain in the left shoulder-joint and angina pectoris, occur in a small number of cases. The diagnosis of pulmonary embolism is often very difficult. The symptoms pointing to the lungs are often obscure, and in severe cases collapse quickly develops. The treatment, if the patient survives the first onset, consists in rest, hot applications, and cardiac stimulants. The preventive treatment is far more important. Early exertion, especially during and after intra-uterine manipulation, should be avoided. This caution is especially necessary in cases of milk leg. A primary thrombosis of the pulmonary artery is also possible, but is thought

to be a rare cause of sudden death in the puerperium. The entrance of air into the uterine veins, or air embolism, is the next most frequent cause of sudden death. Air embolism is a form of pulmonary embolism in which the blood vessels are obstructed by air bubbles. Certain conditions are necessary for the occurrence of air embolism. Air very rarely enters the uterine veins spontaneously, but must be forced into the uterus from without, and must enter the circulation with considerable force to prove fatal. The air may come from the generation of gas within the uterus as a result of the death and putrefaction of the fetus. The uterus must be uncontracted, and the uterine sinuses must be patulous. The preventive treatment consists in the greatest care in all procedures, such as the induction of labor, vaginal and uterine irrigations, and the introduction of the hand for various operations. A firm grasp of the fundus and uterine body, before and during all vaginal and uterine manipulations, is an exceedingly useful precaution. The *symptoms* of the condition are similar to those of pulmonary embolism. The *treatment* is usually without avail. The cervix should be cleared of clots; artificial respiration, and the hypodermatic use of stimulants should be employed.

Decapitation. Decapitation, or the separation of the fetal head from the trunk, is indicated mainly in neglected, impacted shoulder presentations, in which attempts at version would be liable to cause rupture of the uterus. The pelvis

must have a true conjugate of at least $2\frac{3}{4}$ inches, and full dilatation of the cervix is necessary. Braun's hook is the best instrument for the performance of the operation, but the ordinary chain-saw of the surgeon, or even a wire or strong cord may be used in an emergency. Some authorities prefer a sickle-shaped knife, or a stout pair of scissors. *Operation.* If an arm is prolapsed, a tape is attached to it, so that an assistant may make downward traction as required. If the head is lying toward the mother's left side, the left hand is passed into the vagina, palm upward, with the thumb close to the symphysis and four fingers in the hollow of the sacrum, and the neck firmly grasped by the thumb and middle finger. The hook is then carefully passed by the right hand, palm downward, behind the symphysis along the thumb of the hand inside as a guide, until the tip touches the middle finger at the other side of the neck. The neck is now put on the stretch by pulling the handle of the fork firmly downward, while an assistant draws down the arm by the attached tape. A strong rotary movement applied at the handle twists off the neck tissues, portion by portion, until the spinal column is reached. This may be divided by the same rotary motion or by direct downward traction. Care must be taken at this point that the hook does not penetrate the maternal soft parts. This accident may be avoided by substituting a pair of scissors to divide the last shreds of tissue. Throughout the operation the inside hand must

protect the maternal tissues from injury. As soon as the neck is divided, the head recedes, and the body is easily delivered by traction upon the prolapsed arm. The head may be delivered manually, if there are no sharp projecting vertebræ, by passing two fingers into the mouth and delivering as a face presentation. If a sharp projecting vertebral stump exists, either extract the head vertex first with the forceps, or perforate the vertex and extract with the cranioclast.

Decidua, Diseases of the. The decidua is liable to any of the diseases that may attack the mucous membrane of the uterus in the non-pregnant state. Acute inflammation may occur in the course of cholera or other infectious diseases, especially the exanthemata. Following endometritis may be frequent abortions, abnormal positions of the ovum, thickening and retention of the decidua, and arrested development of the fetus. Four varieties of endometritis are commonly described: The polypoid, the hypertrophic, the cystic, and the catarrhal. Chronic catarrhal endometritis is the variety of greatest interest to the obstetrician and deserves further description. The clinical symptom of the disease is the discharge of a watery fluid from the uterus. The amount of fluid is at times so great that the term *hydrorrhœa gravidarum* is applied to this condition. The fluid is of a pale yellow color and transparent. It may escape from the vagina little by little or may come in a sudden gush. It may occur as early as the third month, but usually

takes place in the latter months of pregnancy. The discharge of a large amount of fluid naturally excites the suspicion that the membranes have ruptured. In these cases, however, no labor pains ensue, the os is undilated, and ballottement can be obtained. In most cases this discharge of water is repeated several times before labor occurs. The cause of the condition is obscure. It has been attributed to syphilis, to pre-existing endometritis, and to gonorrhœa. *The prognosis* as a rule is favorable for both mother and child, and the pregnancy is not interrupted. When the discharge is continuous and of a dark hue, the case may not go to term. *The treatment* during pregnancy is absolutely *nil*. The woman should be kept in the recumbent position, and opiates may be given if uterine contractions occur.

Deformities, Pelvic. The subject of pelvic deformities is such a large one that no attempt will be made to describe the rare varieties. Contracted pelves are believed to be rarer in America than abroad, but the regular use of the pelvimeter shows the frequency of the condition even in this country. According to Williams, from 12 to 15 per cent. of women show contracted pelves, but most of these are not sufficiently marked to impede labor. The generally contracted pelvis is the deformity most frequently met with in this country. The simple flat pelvis stands next in order of frequency.

Classification of Deformed Pelves.

(A) *Anomalies of the pelvis as a result of defective development.*

I. Generally contracted, non-rachitic pelvis, justo-minor or small round pelvis: (1) The infantile type; (2) the masculine type; (3) the dwarf type.

II. Simple flat, non-rachitic pelvis.

III. Generally contracted flat, non-rachitic pelvis.

IV. Narrow, funnel-shaped pelvis.

V. Imperfect development of one sacral ala (Naegele pelvis).

VI. Imperfect development of both sacral alæ (Robert pelvis).

VII. Generally equally enlarged pelvis, justo-major pelvis.

VIII. Split pelvis.

(B) *Anomalies of the pelvis as a result of diseases of the pelvic bones.*

I. Rachitis.

II. Osteomalacia.

III. New growths.

IV. Fracture.

V. Atrophy, caries, necrosis.

(C) *Anomalies in the junction of the pelvic bones.*

I. Synostosis at the symphysis.

II. Synostosis at one or both sacro-iliac joints.

III. Synostosis at the sacro-coccygeal joint.

IV. Exaggerated motion, or separation of the pelvic joints.

(D) *Anomalies of the pelvis due to diseases of those parts of the skeleton which are carried by the pelvis.*

I. Spondylolisthesis.

II. Kyphosis.

III. Scoliosis.

IV. Kypho-scoliosis.

V. Lordosis.

(E) *Anomalies of the pelvis due to disease of the weight-bearing parts of the skeleton.*

I. Coxitis.

II. Luxation of the head of one femur.

III. Luxation of the heads of both femora.

IV. Unilateral or bilateral club-foot.

V. The absence or deformity of one or both lower extremities.

I. *Generally contracted, non-rachitic pelvis. Justo-minor pelvis.* This type of deformity is the most frequent in America, especially in the large cities. The clinical characteristics are increased concavity of the sacrum from side to side, narrow wings of the sacrum, sacral promontory pushed up but not prominent, increased distance between the posterior iliac spines, while the iliac crests and anterior spines are closer together than normal. The transverse diameters and the conjugate diameter of the brim are decreased. Women with the generally contracted pelvis are, as a rule, short in stature and slender. The dwarf type is rare and found only in dwarfs. The contraction in most cases is usually slight. This type is differentiated from the rachitic pelvis by the fact that all the measurements, with the possible exception of the external conjugate diameter, are symmetrically decreased. Labor in this form of

contracted pelvis, while tedious, is not necessarily difficult. The head is strongly flexed from the beginning, and for this reason the labor usually terminates naturally. If anything interferes with good flexion, engagement and descent may become impossible. Breech presentations are especially unfortunate, as it is extremely difficult to free the arms and to bring the head through the contracted brim of the pelvis. There is a greater likelihood of rupturing pelvic joints in this than in any other variety of contracted pelvis, and eclampsia is very common. The caput succedaneum is very large and located over the small fontanelle.

II. *The simple flat, non-rachitic pelvis.*

This was the first recognized variety of contracted pelvis, and in Europe is the commonest variety. It is also common in America. The cause of this deformity is obscure, as it is found as often among the upper classes as among the lower; and it is also as common in the well-formed woman as in the stunted. As a rule, this type of pelvis is congenital, and it is probable that heredity is an important factor.

Clinical Characteristics. The antero-posterior diameter alone is shortened, the other measurements remaining normal. The sacrum is displaced forward, and the cartilage between the second and third sacral vertebræ is unusually prominent.

Diagnosis. Unless there has been difficulty in previous labors, the diagnosis must depend upon the measurements. If there is double promon-

tory, as is frequently the case, the conjugate must be measured from the promontory nearest the symphysis.

Influence on labor. Pendulous abdomen is common from failure of the presenting part to enter the pelvis. The head usually presents in a transverse position to accommodate itself to the shape of the brim. The first stage of labor is usually protracted. After engagement has occurred the labor may proceed normally, although instrumental delivery is frequently necessary. Early rupture of the membranes is common, and malpresentations and prolapse of the cord and the extremities are frequent. Necrosis of the maternal soft parts sometimes results from the long pressure to which they are subjected. The caput succedaneum is not abnormal, but there is apt to be a depression on that part of the skull applied to the promontory. This depression is usually observed upon the posterior parietal bone. Sometimes a deep groove may be noted running outward and forward on the child's skull.

III. *Generally contracted flat, non-rachitic pelvis.*

This pelvis has the peculiarities of both the generally contracted and the flat pelvis. The deformity is usually congenital, although some authorities believe that it can be caused by too early walking.

Clinical Characteristics. With the exception of the diagonal conjugate all of the pelvic diameters are decreased, particularly the internal conjugate

of the inlet. The sacrum is small, the promontory high, but not prominent. The alæ, as well as the innominate bones, are not fully developed.

Diagnosis. An absolute diagnosis can be made only by direct measurement of the diameters, and is even then difficult. The diameters resemble those obtained in a generally contracted pelvis, but the conjugate diameter is less than one expects in that form of contracted pelvis. The ease with which the lateral walls of the pelvis can be palpated aids in the diagnosis.

Influence on labor. Labor in this type of contracted pelvis resembles that in a case of simple flat pelvis, but is more difficult owing to the lack of compensatory room in a transverse direction.

IV. *The narrow, funnel-shaped pelvis; fetal or undeveloped pelvis.* The name suggests the shape and the etiology of this type of pelvis. It has been considered an exceedingly rare form of pelvic deformity, but is more common than usually supposed. It is caused by the absence of the forces upon which the development of the normal pelvis depends. It is present in its most typical form in cases of infantile paralysis, where walking has never been possible. A slight manifestation of this deformity is termed a "masculine" pelvis by reason of the diminished breadth of the pubic arch, and is frequently observed.

Clinical Characteristics. A long, narrow, straight sacrum and unusual elevation of the promontory are marked features. The whole pelvis is narrow and deep with rapidly converg-

ing side walls. The pelvic outlet is thus contracted in the transverse diameter, and the antero-posterior diameter may also be diminished. The spinal column is normal.

Diagnosis. The diagnosis depends upon a careful comparison of the measurements of the pelvic inlet and outlet. The former are found to be normal or above the normal, while the latter are diminished. The internal examination of the pelvic canal reveals very clearly the convergence of the lateral walls, the narrow pelvic arch, and the close relation of the ischial tuberosities and spines.

Influence upon labor. Malpositions of the head at the outlet (as backward rotation of the occiput), oblique and transverse positions of the head, and imperfect flexion are the main features in the mechanism of labor in this type of contracted pelvis. Spontaneous delivery takes place only in the slightest degree of this deformity. The presenting part is forced backward by the pubic rami, and extensive laceration of the perineum is the result. It may be possible to deliver with forceps, but serious injuries to the soft parts often result from injudicious attempts to employ the forceps. If the transverse diameter of the outlet is much below 3 inches, symphyseotomy is indicated. Higher grades of contraction demand Cesarean section.

V. Obliquely-contracted pelvis from imperfect development of one lateral mass of the sacrum. Nægele's pelvis.

There are two theories as to etiology.

(1) Absence of bony nuclei in the ala or lateral process on one side of the sacrum. (2) Inflammatory changes causing synostosis. The lateral process fails to develop, and the innominate bone comes into relation with the bodies of the vertebrae. When walking begins, the pressure upward forces the posterior extremity of the innominate bone upward and backward. The irritation and strain of this unnatural movement bring about the atrophy and ankylosis of the sacro-iliac joint.

Clinical Characteristics. The sacral ala is absent or atrophied. The asymmetrical narrow sacrum faces the deformed side, while the promontory is twisted toward the same side. The external surface of the symphysis also faces toward the diseased side. The crest of the ilium on the diseased side lacks its normal curvature and may run almost straight from the sacro-iliac joint to the symphysis. The opposite innominate bone has a greater curvature in its anterior part than normal, but is otherwise unchanged. The spine of the ischium on the diseased side is brought close to the edge of the sacrum and extends prominently forward into the birth canal. The sound side of the pelvis is enlarged. There is no shortening of the true conjugate, and, therefore, this deformity is often unrecognized.

Diagnosis. The diagnosis can only be made by careful measurements. By an internal examination the position of the ischial spines should direct attention to the asymmetry of the pelvis, while

the contracted pubic arch and distorted promontory should also be noted. The majority of these cases, however, have been diagnosed after death. A rectal examination is valuable for detecting an ankylosed joint. The most valuable measurement externally is that from the trochanter major of one side to the iliac crest of the other, and *vice versa*.

Influence on labor. The results of labor in the Naegele pelvis have been very bad. Two-thirds of the cases have terminated fatally. The fetus must pass through the healthy side of the pelvis, and the mechanism of labor is similar to that of the generally contracted pelvis. The head is extremely flexed as it enters the pelvis. As the head descends anomalies of mechanism appear, similar to those encountered in the narrow, funnel-shaped pelvis, namely, abnormal and imperfect rotation and anomalies of flexion. The head must enter and pass through the pelvis with its longest diameter in the longest oblique diameter of the pelvis, from the diseased sacro-iliac joint to the ilio-pectineal eminence of the opposite side. Various accidents are apt to occur during labor, such as ruptures, fistulæ, fractures, etc.

Treatment. The treatment varies according to the degree of deformity present. Cesarean section should be the operation performed, unless the deformity is slight. Forceps and version may be successful under favorable conditions, but, if the attendant is in any doubt, Cesarean section should be performed.

VI. *Imperfect development of both sacral alæ. Robert's pelvis.*

This is the rarest of all contracted pelves, only eight cases having been recorded. The sacrum is extremely narrow, and the posterior superior spinous processes of the iliac bones are close together. There is usually ankylosis of both sacroiliac joints. Cesarean section is the indicated operation.

VII. *Generally equally enlarged pelvis. Justo-major pelvis.* This type of pelvis may be found in women of medium height, although it is also observed in giants. It is a congenital condition. All the diameters are noticeably increased. During pregnancy the uterus sinks lower in the pelvis than usual, and pressure symptoms are greatly increased. Locomotion is often difficult. Labor is usually not disturbed, but may be precipitate. Imperfect flexion and tardy internal rotation, owing to lack of resistance, may be observed.

VIII. *The Split pelvis.* This variety of deformed pelvis is commonly associated with exstrophy of the bladder. There are on record but seven cases complicating labor. The symphysis pubis is the portion of the pelvis usually affected. There is no obstacle to labor, but there is almost invariably prolapse of the uterus after labor.

ANOMALIES OF THE PELVIS AS A RESULT OF DISEASES OF THE PELVIC BONES.

I. *The Rachitic Pelvis.* There are several varieties of the rachitic pelvis. The flat rachitic pelvis,

the flat, generally contracted, rachitic pelvis, and the pseudo-osteomalacic pelvis. Three influences affect the pelvis in rachitis: (1) Arrest of development. (2) The pressure from the trunk above and the counter-pressure from the extremities below. (3) The pull on the pelvic bones by the attached ligaments and muscles. The pelvis is below the normal size with a distorted inlet. The cavity is very shallow. The pubic arch is widened, and the promontory of the sacrum abnormally prominent. As a rule the bones of a rachitic pelvis are fragile and small; occasionally they are coarser and heavier than normal. In the flat rachitic pelvis the iliac bones are broadened, so that the distance between the anterior spines is greater than between the crests. The antero-posterior diameter of the inlet is shortened, and the anterior surface of the sacrum is straight or convex. The transverse diameter of the outlet is increased. The interference with labor ends when the head has passed the inlet. The influence on labor depends upon the amount of contraction at the brim. A true conjugate below $2\frac{1}{8}$ inches is absolutely contracted. The course of labor in the flat rachitic pelvis is similar to labor in the simple flat pelvis, except that the contraction is greater in the rachitic type, and the promontory of the sacrum is more prominent. Injuries to the child's head from pressure are common. The posterior parietal bone is often the seat of spoon-shaped depressions with fracture.

The generally contracted rachitic pelvis.

This rare type of rachitic pelvis is the result of arrested development in consequence of rachitis in very early life. The disease ran its course before the age at which walking begins, so that the shape of the pelvic brim is but little changed from normal. A contraction of the transverse diameter, as seen in the fetal pelvis, is the most marked feature.

The pseudo-osteomalacic pelvis. In this type the rachitis has been severe and long continued. Efforts to walk have been made while the disease is in active progress, and, as a result, the pelvis bends to an extreme degree. The sacrum sinks deeply into the pelvic cavity and is sharply curved. The innominate bones are bent at a sharp angle, and the acetabula pressed inward. When the rachitis has run its course, the bones harden in their distorted position.

Diagnosis of rachitic pelvis. The history of the patient, signs of rachitis in other parts of the body, and the external and internal measurements of the pelvis furnish the requisite data for correct diagnosis. A woman who has had rachitis in childhood is usually short with thick curved limbs, enlarged joints, square head, and chicken breast. The abdomen is short, and on this account, coupled with the failure of the presenting part to engage in the brim, the fundus hangs far forward and downward at times. The characteristic points in the history are the late age at which she walked and the late teething. The normal relation between the spines and crests of the

ilium is absent, so that the measurements are practically the same.

Double promontory of the sacrum is not unusual. The measurement should be taken from the one nearest the symphysis. In some cases the lumbar vertebrae are curved inward, so that they present an obstruction above the brim. This results from rachitis of the spine.

II. *Osteomalacic pelvis*. This type of pelvic deformity is rare in America, although common in certain parts of Europe. In this disease the bones of the pelvis are so soft that they yield to every force to which they are subjected. The pelvic walls are so compressed that they almost obliterate the pelvic cavity, and the spinal column bends far forward and descends low into the pelvis. The ischia and pubes are pushed inward and backward, making a sharp beak-like projection of the pelvic inlet in front, while the lower portion of the sacrum and the coccyx are pulled sharply forward, so that the sacrum is bent at a sharp angle in its lower third.

Diagnosis. The disease begins during pregnancy or lactation, with dull aching pains in the extremities, the back, and over the anterior portion of the pelvis. The pains are increased by every movement, and the pelvic bones are tender to pressure. As the disease progresses, the bones of the spinal column are so bent and compressed that an extraordinary decrease in stature results. The flexibility of the pelvic bones can be demonstrated by direct pressure. Internal examination shows the

peculiar beak-like space behind the symphysis, and later in the disease the almost complete obliteration of the pelvic canal.

Influence upon labor. In 85 cases collected by Litzmann, 47 were fatal. Although the pelvis is so flexible, the obstruction is very marked. Spontaneous delivery is possible, although the majority of cases require interference. The most successful treatment in modern times is the performance of Cesarean section. A complete Porro operation materially aids recovery from the disease.

III. *New Growths.* Bony excrescences over one of the pelvic joints constitute the majority of pelvic tumors. These bony growths usually project sharply into the pelvis and cause a high degree of dystocia. The pelvis thus deformed is known as acanthopelvis, or a pelvis spinosa, spiny or thorny pelvis. Most of these exostoses are small, about the size of a bean or small olive, but in some cases they may attain the size of a pigeon's egg. When sharp bony points project into the pelvis, injury to the uterus, or to the head of the fetus, is common. Other tumors occurring in the pelvis are enchondromata, fibromata, sarcomata, carcinomata, and cysts; their importance in obstructing labor depends upon their size. The treatment of labor obstructed by tumors of the pelvis is the performance of Cesarean section.

IV. *Fractures of the pelvis.* An exceedingly rare deformity of the pelvis is that produced by a fracture which unites in such a manner that the pelvis

is distorted. Fractures of the pelvis are uncommon, and, when they do occur, a fatal termination is usually the result. The seat of fracture is most frequently the os pubis, and least frequently the sacrum. Fracture of the pubes results in an irregular distortion of the pelvic inlet, most marked on the injured side. In a fracture of the acetabulum the head of the femur may project into the pelvic cavity. A fracture of the ala of the sacrum may cause an oblique contraction of the pelvis like that of the Naegele pelvis.

V. Atrophy, Caries and Necrosis. In rare cases of tuberculosis of the sacro-iliac joint, an oblique contraction of the pelvis may result. When the sacro-iliac joint is affected with caries or necrosis, the effect upon the pelvis is the same as in the production of the true Naegele pelvis from imperfect development of an ala of the sacrum. There is atrophy, ankylosis of the joint, and an arrest of development, if the disease occurs in early childhood.

ANOMALIES IN THE JUNCTION OF THE PELVIC BONES.

Ankylosis and Relaxation of the Pelvic Joints. Synostosis may develop in any of the pelvic joints, and is comparatively common in the symphysis pubis. This condition presents a difficulty when the operation of symphysectomy is attempted, but otherwise does not obstruct labor. If synostosis of the sacro-iliac joint develops in early life, the result is a poorly-developed sacral ala on the side af-

fect, and the production of the obliquely contracted Naegele pelvis. If the synostosis does not occur until after puberty, it exerts little or no effect upon the pelvis. If both joints are affected in early life, a pelvis like the Robert pelvis is the result. The sacro-coccygeal joint becomes ankylosed, as a rule, between the thirtieth and fortieth years, but, as the joint between the first and second coccygeal vertebræ is unaffected, the expansion of the pelvic outlet occurs nearly as well as under normal conditions. Ankylosis may occur in all the joints of the coccyx. Under such conditions labor can be terminated only by the fracture of the coccyx. This fracture may occur during the natural passage of the head, but is more common in instrumental deliveries. An abnormal relaxation of the pelvic joints may be a simple exaggeration of the normal condition of the joints during labor, but is more apt to depend upon some pathological condition. Such pathological conditions include inflammation, followed by suppuration, fluid in the joints, osteomalacia, caries, and new growths.

Locomotion may be difficult in the latter part of pregnancy from relaxation of the joints. There is increased liability of the joints to rupture under these conditions.

ANOMALIES OF THE PELVIS DUE TO DISEASES OF
THOSE PARTS OF THE SKELETON WHICH
ARE CARRIED BY THE PELVIS.

Spondylolisthesis. Kilian's Pelvis, Rokitansky's Pelvis, Prague Pelvis,

The name is derived from two Greek words, which signify a slipping down or dislocation of the vertebræ. To affect the pelvis, spondylolisthesis must occur in the lumbo-sacral region. In obstetrics the term means a dislocation of the last lumbar vertebræ in front of the first sacral vertebra. A marked lordosis occurs of necessity, and the fourth, and third, and possibly the second lumbar vertebræ descend into the pelvis, thus diminishing the antero-posterior diameter of the inlet. The degree of contraction is usually not excessive, but often prevents the engagement of the head. It is not a common condition, and its etiology is obscure. It has been attributed to falls and other direct injuries, and the carrying of excessive weights. Exaggerated pressure from above in consequence of excessive body weight appears to be the commonest direct cause.

Diagnosis. The diagnosis should not be difficult. There is marked lordosis in the lumbar region. The patient is rather short. The buttocks present a peculiar heart-shaped appearance, being flattened and coming to a point below. The abdomen is pendulous and deeply creased above the symphysis. The floating ribs rest upon the ilia or sink below them, and the soft structures of the flanks stand out in prominent folds. The gait is peculiar, and the patient complains of a disposition to fall forward. In walking the steps are short, and one foot is placed directly in front of the other, so that the foot prints are in a straight line. Measurements of the pelvis show a marked decrease in the

external conjugate, an increased distance between the posterior spines, and a diminished distance between the anterior spines and the crests. The internal conjugate must be taken from the lumbar vertebra nearest the symphysis.

Influence upon labor. The effect of this deformity of the pelvis upon labor depends, of course, upon the amount of descent of the lumbar vertebrae. The mechanism of labor is essentially the same as in a simple flat pelvis. Lacerations, fistulae, and tears are common accidents, owing to the fact that the presenting part strikes the middle of the pelvic floor as it descends instead of being directed forward to the orifice of the vulva. If the deformity is recognized before labor, and the effective conjugate is not less than $3\frac{1}{4}$ inches, the forceps may be able to deliver the child. If the conjugate is less than three inches, a Cesarean section should be performed. The induction of premature labor and symphyseotomy may be considered, when the conjugate measures between 7 and 9.5 centimeters.

Kyphosis. The deformity of the pelvis, which results from kyphosis, depends upon the occurrence of this deformity of the spine at so low a point that the compensating lordosis in the lumbar region is not sufficient to overcome the faulty direction of the body-weight. The most common position for the kyphosis is at the junction of the dorsal and lumbar vertebrae. As a result the sacrum is rotated downward and backward on its transverse axis. Thus the sacrum is straighter,

narrower, more curved from side to side, and longer, while the posterior superior spines are brought nearer together, and the anterior spines are separated more widely. To preserve the body from falling forward, the knees and thighs are slightly flexed, and the pelvic inclination is almost completely lost. The conjugate diameter of the inlet is increased, while the width of the pelvis is decreased throughout, but especially at the outlet. The coccyx and the end of the sacrum are pushed forward, still further diminishing the size of the outlet.

Influence upon labor. There is usually no interference with the natural course of labor until the head reaches the pelvic floor. If the occiput is posterior, rotation will hardly occur on account of the obstruction, and a persistent occipito-posterior presentation results. If the occiput is anterior, the obstruction, may still be so great that spontaneous delivery is impossible. The application of forceps may be sufficient to effect delivery. If unsuccessful, symphyseotomy will usually overcome the difficulty. In case of a dead fetus, craniotomy is easily done, as the head is on the pelvic floor.

Scoliosis. The scoliotic pelvis is a rare form of pelvic deformity, and in the majority of cases is rachitic in origin. The deformity begins, as a rule, during the development of the pelvis, and the result upon the pelvis varies with the time of the onset of the spinal deformity. There is a certain amount of oblique contraction of the pelvis. The lumbar

vertebræ are the ones usually affected. The innominate bone upon the side to which the vertebræ are bent receives the greater part of the body-weight and is pushed upward, inward, and backward by the head of the femur. There is also an anterior upward displacement of the acetabulum upon this side. The pelvis on the deformed side is diminished in size. The asymmetry is seldom so marked as to cause serious obstruction to labor. The mechanism of labor corresponds to that in the generally contracted pelvis. The application of forceps is indicated, as a rule, after the head has moulded.

Kyphoscoliosis. A combination of kyphosis and scoliosis of the spinal column may produce a pelvis showing the combined features of both deformities, but the kyphosis, being of rachitic origin in these cases, will not be angular and will be located high up in the dorsal region and may be entirely compensated for by lordosis in the lumbar portion of the spine. The true conjugate is increased, and the pelvis is transversely flattened.

Lordosis. Primary lordosis, independent of spinal disease or pelvic deformity, is very rare. Only one case has been described in this country. It will be readily understood how such a condition would increase the pelvic inclination and interfere with the engagement of the presenting part.

ANOMALIES OF THE PELVIS DUE TO DISEASES OF THE WEIGHT-BEARING PARTS OF THE SKELETON.

I. *Coxitis, Coxalgic Pelvis.* This type of pelvis is an oblique pelvis dependent upon hip disease.

The earlier the hip joint disease begins, and the more the leg is used, the greater will be the deformity. There are two types of this deformity of the pelvis. In the first type the innominate bone upon the healthy side is pushed upward, inward, and backward. No difficulty is experienced in this type, unless rachitic deformity is associated. In the second type the bone upon the diseased side is forced inward upon the pelvic canal. There is a lack of developement of this side of the pelvis, often associated with atrophy of the ala of the sacrum and ankylosis of the sacro-iliac joint. There is much greater contraction of the pelvis in this type, and the obstacles to delivery may be as great as in the true Naegele pelvis.

II. *Luxation of the Femora.* If this deformity is congenital or occurs in early life, the pelvis is somewhat affected, but usually not to any serious extent. If the dislocation is one-sided, an oblique contraction of the pelvis may be produced. If both femora are dislocated backward upon the iliac bones, the sacrum is rotated forward, and the pelvic canal becomes shallow with a very wide outlet.

III. *Unilateral or Bilateral Club-foot.* These deformities affect the pelvis but slightly. The inclination is increased, the arch of the pubis is narrowed, the tuberosities of the ischia and the acetabula are brought closer together.

IV. *Absence or Deformity of One or Both Lower Extremities.* The absence of one lower extremity may cause oblique contraction of the

pelvis to a serious degree. The body-weight falling on the sound leg pushes the innominate bone of that side upward, backward, and inward. In the absence of both lower extremities the characteristic "Sitz-pelvis" is found, in which the innominate bones are rotated in such a manner that the crests of the ilia approach each other, while the tuberosities of the ischia are separated.

Management of Labor in Contracted Pelves.

The management of labor obstructed by a contracted pelvis is one of the most difficult problems in medicine. Statistics show that the great majority of labors in pelvis, only slightly contracted, require no intervention, yet even in relative contraction spontaneous delivery may be impossible. If the true conjugate diameter is below 9.5 centimeters, the choice must be made between the induction of premature labor, and forceps, version, symphyseotomy, or Cesarean section at term. The induction of premature labor at the thirty-sixth week is without danger to the mother, if properly performed, and the results as far as the child is concerned are fairly good. If the conjugate measures 8 centimeters or a trifle less, the induction of premature labor, and, if necessary, symphyseotomy will give successful results. If the conjugate is 7.5 centimeters or less, symphyseotomy will be necessary in addition to the induction of premature labor. With a conjugate diameter below 6.5 centimeters Cesarean section at term is the only treatment. If the physician see the patient for the first time in labor, or only dis-

covers the deformity after labor has begun, he must choose between the following methods: Expectant treatment allowing the head to engage naturally; forceps; version; symphyseotomy; or Cesarean section. It is good treatment in the majority of cases, unless the contraction is manifestly extreme, to wait for the full dilatation of the os, watching carefully the character of the pains and the moulding of the head. The possible rupture of the uterus, as evidenced by the situation of the contraction-ring, must always be borne in mind, and operative measures instituted before uterine rupture is imminent. The application of forceps, if the head can be made to engage in the pelvis by supra-pubic pressure, is the first procedure to be tried. If the head can not be made to engage, version should be performed. The disadvantages of version are: (1) no great force can be exerted upon the fetal neck without danger; (2) rapid extraction is necessary to secure a living child; (3) extension of the head and arms is always liable to occur, seriously affecting the prognosis. If forceps have failed, and the risks of version appear too great, the choice of method of delivery lies between symphyseotomy and Cesarean section. If the conjugate is above 7 centimeters, symphyseotomy should be chosen; in cases of greater contraction, Cesarean section.

Diabetes in Pregnancy. True diabetes is exceedingly rare during pregnancy, but glycosuria in pregnancy and the puerperal state is frequently found, if sufficiently delicate tests are employed.

True diabetes occurring in pregnancy is almost uniformly fatal to the fetus. Dropsy of the amnion is usually present, and the liquor amnii contains sugar. Abortion usually occurs at a comparatively early period of gestation. In some cases diabetes sets in during pregnancy and terminates spontaneously after delivery. These cases would appear to be due to a toxemia. When a diabetic woman becomes pregnant, the disease is affected unfavorably. Temporary improvement may appear after delivery, but the patient does not survive long.

Diameters, pelvic. The diameters of the pelvis are taken in three planes; the plane of the inlet or superior strait; the plane of the cavity or mid-plane; the plane of the outlet or inferior strait. The diameters are the antero-posterior, transverse, and right and left oblique. The diameters of the inlet are as follows: the *antero-posterior diameter*, or *true conjugate*, measured from the middle point of the sacral promontory to a point about $\frac{3}{4}$ inch below the top of the symphysis, is $4\frac{1}{4}$ inches (11 centimeters). The *anatomical* antero-posterior diameter is $4\frac{1}{2}$ inches (11.25 centimeters).

The *transverse* diameter of the inlet, measured between the most distant points of the ilio-pectineal lines, is $5\frac{1}{2}$ inches (13.5 centimeters).

The *right oblique* diameter, measured from the right sacro-iliac synchondrosis to the left pectineal eminence, is 5 inches (12.5 centimeters). The *left oblique*, measured from the left sacro-iliac synchondrosis to the right pectineal eminence, is 5 inches (12.5 centimeters).

The diameters of the cavity. (1) The *antero-posterior diameter*, measured from the middle of the pubic joint to the junction of the second and third sacral vertebræ, is 5 inches (12.5 centimeters). (2) The *transverse diameter*, measured at the same level, is $4\frac{3}{4}$ inches (12 centimeters). (3) The *oblique diameter*, measured from the middle of the great sciatic foramen to the middle of the obturator foramen, is $4\frac{3}{4}$ inches (12 centimeters).

The diameters of the outlet. (1) The *antero-posterior diameter*, from the middle of the sub-pubic ligament to the tip of the coccyx, is $3\frac{3}{4}$ inches (9.5 centimeters). Backward recession of the coccyx increases this diameter to $4\frac{3}{4}$ inches (12 centimeters). (2) The *transverse diameter*, between the inner surfaces of the ischial tuberosities, is 4 inches (11 centimeters). (3) The *right* and *left* oblique diameters, from the center of the right and left sacro-sciatic ligaments respectively, are $4\frac{3}{4}$ inches each (12 centimeters).

Diet in pregnancy. The diet of the pregnant woman should be plain, easy of digestion, and highly nutritious. A mixed diet with plenty of vegetables and fruit is the best under normal conditions. In the latter part of pregnancy the amount of food taken at one time can not be so great on account of the upward pressure of the uterus. The intervals between meals should, therefore, be shorter. The diet must be modified in cases of albuminuria and in the vomiting of pregnancy. The influence of diet upon the course

of labor has received considerable attention of late years, and it has been asserted that a diet composed exclusively of vegetables and fruit makes child-birth comparatively easy. Among scientific obstetricians the most successful procedure as regards diet and its influence upon labor is the Prochownik diet in cases of contracted pelvis. This diet is designed to limit as far as possible the accumulation of fat by the child and the precipitation of the earthy salts required for ossification. In this diet fluids and carbo-hydrates are reduced to the lowest possible point. The diet is as follows:

Breakfast. A small cup of black coffee; zwieback or bread with a little butter, four or five ounces.

Luncheon. Any kind of meat or fish, eggs, green vegetables, salad, cheese.

Dinner. Same as luncheon, with bread and butter (one to two ounces).

Absolutely forbidden. Water, soup, potatoes, farinaceous food, sugar, beer.

Fluids allowed. Ten to fourteen ounces red or Moselle wine per diem. This diet is not begun until the last six weeks of gestation. The results have been very encouraging, although the tendency of this highly nitrogenous diet to favor eclampsia must not be overlooked.

Dilators, uterine. Instruments for the dilatation of the cervix are either *hard* or *soft*. The hard dilators are made of metal or vulcanite. There are several varieties, Hanks', Hegar's, Peaslee's, etc. The patient is placed in the lithotomy

position, the anterior and posterior lips of the cervix steadied with volsellum forceps, and the perineum retracted by a speculum. The dilators rendered aseptic and well oiled are then introduced one after another, until the requisite degree of dilatation is secured.

Branched steel dilators have been used to some extent within the last few years. The well-known four-bladed dilator of Bossi is probably the best example of this type of dilator. The use of these powerful instruments is rarely called for in obstetric practice. The soft dilators are various patterns of rubber bags which are introduced in a collapsed state and then distended with air or with water. The well-known Barnes' bag already described has been extensively used. McLean's modification of Barnes' bag has two chambers and two bags. The bag of Champetier de Ribes is made of silk, covered with rubber. This reduces the liability of bursting. When distended this bag is cone-shaped. The larger end of the cone is introduced first. This is the best of the soft dilators and acts as an artificial bag of waters. A certain amount of dilatation is necessary before these soft dilators can be used. The large sizes of the Champetier de Ribes bag should be avoided and only the smaller ones used.

Disinfection, *see antisepsis.*

Eclampsia. An acute morbid condition, occurring during pregnancy, labor, or the puerperal state, which is characterized by a series of tonic and clonic convulsions, accompanied by complete loss of consciousness, and ending in coma or sleep.

Frequency. The frequency of eclampsia has been variously estimated by different authorities. The statement that it occurs once in 250 or 300 labors is believed to be approximately correct. Eclampsia occurs most often in the latter part of gestation, less often in labor, and least of all in the puerperal state.

Etiology. The essential cause of eclampsia has yet to be discovered. The accepted theory at the present time considers auto-intoxication the probable cause.

Predisposing Causes. (1) All chronic and acute forms of kidney disease which result in failure of elimination, hydræmia, albuminuria, and œdema. (2) Retention of urine, particularly that produced by pressure upon the ureters. (3) Primiparity. Very young or very old primiparæ are especially liable to eclampsia.

Exciting Causes. When the predisposing conditions are present, the exciting cause of the actual convulsion may be very slight. Such exciting causes may be (1), sudden partial, or complete suppression of urine; (2), constipation; (3), painful uterine contractions, or a rigid os; (4), prolonged efforts at expulsion; (5), profound emotion. When one convulsion has occurred, the slightest shock is sufficient to cause a renewed paroxysm.

Pathology. The brain may present no conspicuous lesion on post mortem examination, or there may be great anæmia with œdema. In rarer cases hyperæmia is present. The kidneys are not

always found extensively diseased, although many cases show the lesions of acute or chronic nephritis. The lesions of the liver are regarded by some authorities as more important than those of the kidneys. Almost complete disorganization of the liver may be found in some cases. Hemorrhagic areas are present in the substance of the organ as well as beneath the capsule. In the lungs there may be œdema, or pneumonia.

Symptomatology. The *premonitory symptoms* are as follows: nausea and vomiting, restlessness, mental irritability, tinnitus aurium, disturbances of vision, headache, and epigastric pain. The last three symptoms are the most important. Epigastric pain, while not constant, is quite significant. If severe and continuous, the convulsive attack is imminent. The headache is usually frontal, affecting the whole forehead. The disturbance of vision may range from dim sight to absolute blindness. In some rare cases a well-defined aura, as in epilepsy, precedes the convulsion. The symptoms of actual eclampsia are as follows: convulsive twitching of the eyelids, the eyes stare, and the pupils are widely dilated. The face is deeply congested, and there is rapid jerking of the muscles about the alæ of the nose and the mouth. The mouth is drawn to one side, the head rotates from side to side, and the eyeballs are turned upward. The tongue is thrust between the teeth. The convulsive movements now extend to the neck, trunk, and upper extremities. The neck is bent backward, and the whole body may be arched upward. The

arms are extended and rigid, and the thumbs are turned inward into the palms of the clenched hands. The knees are flexed upon the abdomen. The muscles of the chest are firmly contracted, so that respiration is usually arrested. This tonic convulsion lasts from ten to twenty seconds, and is followed by clonic convulsions, which begin in the face and extend over the body. Respiration returns, but it is stertorous and accompanied by moist bronchial *râles*. The jaws open and close rapidly, and the tongue is apt to be bitten. The clonic convulsions cease in from one to five minutes, and full, labored, and stertorous respiration occurs. In one or two minutes the stage of coma begins. This stage lasts about half an hour, consciousness and sensation slowly returning. If the case is to have a favorable issue, the patient soon sinks into a deep sleep, and awakes with no recollection of what has occurred. Rarely there is but a single attack. As a rule, after an interval of half an hour, or even several hours, the convulsions recur, and one attack may follow another without any restoration to consciousness. A progressive rise of temperature is a very unfavorable sign and usually portends a fatal issue. The pulse in these cases becomes small and wiry, and death results from pulmonary œdema, cerebral congestion, hemorrhage, or exhaustion.

The Effect of Eclampsia Upon the Fetus and Upon Labor. One attack may be sufficient to kill the fetus, or it may survive several attacks. The fetus may die, the eclampsia disappear, and the

case go on to full term and be delivered without a return of convulsions. In the majority of cases, however, if labor has not begun, uterine contractions are excited, and delivery occurs. If the attack occurs during labor, uterine action is greatly intensified, and delivery may occur while the patient is unconscious. The death of the fetus occurs in about 50 per cent. of all cases. This death may result from placental hemorrhage, from asphyxia, or from the same poison that causes the convulsions of the mother.

Diagnosis. There are four conditions which may possibly confuse the diagnosis. These are epilepsy, hysteria, apoplexy, and meningitis. The characteristics of the urine, together with the clinical picture, should render the diagnosis clear.

Prognosis. The maternal mortality is about 30 per cent. The prognosis is favorable when: (1) The attacks are far apart and not severe. (2) The child perishes. (3) The patient has conscious intervals between the attacks. (4) The quantity of albumin is small. (5) Decrease of temperature occurs. (6) The first convulsion occurs in advanced labor or after delivery. When opposite conditions prevail, the prognosis is not favorable.

Treatment. The prophylactic or preventive treatment is far more important than the treatment of the actual attack. The belief that eclampsia depends upon toxemia, while not an established truth, furnishes the best guide to appropriate preventive treatment. The careful and systematic examination of the urine, and the

amount of urea eliminated, are of the greatest value as an indication of the excretory activity of the system, but the physician should always watch for the general symptoms which indicate toxemia. The line of treatment for the pre-eclamptic state is as follows:

1. *Reduce the amount of nitrogenous food to the minimum.*

2. *Limit the production and assist the elimination of poisonous materials by improving the action of the bowels, the kidneys, the liver, the skin, and the lungs.*

3. *If conditions do not improve, induce labor.*

An exclusive milk diet fulfills the first indication, and too much stress cannot be laid upon this measure.

To secure increased elimination an abundance of pure air and water is absolutely essential. Light exercise or massage are helpful adjuvants. The bowels should be freely moved by the use of broken doses of Calomel followed by a saline in the morning, or by one of the sulphur waters as Rubinat or Villacabras. The various forms of Cascara may be used for their laxative action upon the bowels. When more energetic action of the bowels is required, a pill composed of extract of Colocynth and extract of Aloes is efficient. The action of the skin is promoted by the hot bath, hot pack, or hot air bath, according to the urgency of the case. The underclothing should be made of wool or flannel. In the light of our present knowledge of eclampsia the treatment outlined above appears

reasonable and proper. If toxemia is the underlying cause of the dangerous symptoms which precede eclampsia, no intelligent physician would refrain from the prompt use of measures which would eliminate the poisons already present as quickly as possible, and would limit their further production as far as possible.

In the treatment of eclampsia there is practical unanimity of opinion as regards the main outlines, while there is some difference of opinion in respect to details. The main indications are to control the convulsions and to eliminate the poisons which cause the convulsions. The fact that eclampsia is much less fatal after delivery has led many obstetricians to advocate rapid delivery as a method of treatment. This method is still on trial, and, while it may be successful in skilled hands, should not be attempted by the ordinary practitioner. As a rule, it is better to avoid interference with the progress of labor, unless the os is fairly well dilated. The physician's attention should be directed to the control of the convulsions. It is usual to find that the os has dilated rapidly during the convulsive attacks. The best agents to control the convulsions are *Chloroform*, *Morphine*, *Chloral*, and *Veratrum viride*.

Chloroform is the most reliable agent for immediate control of the convulsions. *Veratrum viride* in doses of from 10 to 20 minims of the fluid extract, by hypodermatic injection, will bring the pulse down to 60, and at this pulse rate convul-

sions are practically unknown. If the pulse is weak, morphine hypodermatically, and chloral administered by rectum in doses of from 30 to 60 grains, will give the best results in controlling the convulsions. To eliminate the poisons in the system, we must stimulate the action of the bowels and the skin. Croton oil on the tongue is one of the best means of producing free catharsis. A concentrated solution of Epsom salts may be given by the mouth if the patient is able to swallow, but acts more quickly if it is thrown high up into the bowel by means of a rectal tube. The use of normal salt solution, either injected under the breasts, or in extended irrigation of the lower bowel, is of much value. The skin is excited to action by the hot wet-pack, or the hot-air bath. The following scheme of treatment for the average case, as recommended by Hirst, may prove helpful:

“During the attack itself, administer chloroform. As soon as the attack has passed off, inject under the skin fifteen drops of the fluid extract of *Veratrum viride*, and administer by the bowel a dram of Chloral in solution. Place upon the back of the tongue two drops of Croton oil diluted with a little sweet oil. Wring out three or four blankets in very hot water, and wrap the woman's nude body in them, wrapping one around each limb and covering the trunk with another, and over all piling as many dry blankets and heavy coverings as can be procured. Inject by gravity under the breasts a pint or more of normal salt solution, or inject several quarts of the salt solution into the

bowel. If convulsions recur, repeat the Veratrum viride in five drop doses, if the pulse is quick and strong. If the face is congested and swollen, and the pulse remains full and bounding, venesection should be employed. Chloral may be repeated two or three times, if the convulsions persist and are violent. If the face is pale and the pulse rapid and weak, stimulation may be required. If the convulsions cease and the patient lies in a stupor, but can be aroused somewhat and is able to swallow, concentrated solution of Epsom salts, in dessertspoonful doses, should be given every fifteen or thirty minutes, until catharsis is established."

Embryotomy. This word is used by some authors to include all mutilating operations upon the fetus, while others restrict its use to mutilating operations upon the trunk alone. In the narrow sense it includes decapitation, and evisceration or eventration.

Endometritis during Pregnancy. A previous inflammatory condition has existed and is aggravated by the congestion caused by pregnancy. The diagnosis is made by the history of previous attacks, and by the occasional discharge of blood or watery mucus. An endometritis aggravated by pregnancy frequently causes adhesion of the membranes, premature rupture of the bag of waters, and adherent placenta. The existence of an old endometritis is always liable to cause early abortion. The *treatment* of this condition should be entirely in the interest of the mother. If hemorrhage is considerable, and fever is present, the

uterus should be emptied, and thoroughly curetted and drained. If fever and foul discharge continue, repeated intra-uterine injections should be employed.

Episiotomy. This term is applied to the operation of making lateral incisions in the vulva to avoid laceration of the perineum. This operation, while common in Germany, has fallen into disuse in England, America, and France. Most American obstetricians hold that it is rarely necessary. If the operation seems advisable, the operator should remember that it is not the border of the vulva which resists the progress of the head, but the tense ring about half an inch above. The incisions should be made obliquely at a point about one-third of the distance from the posterior to the anterior commissure, when the parts are on the stretch. The structures divided by such an incision are unimportant. The incision should be not more than one inch in length and a quarter inch in depth. After delivery the incisions are at once closed by suture. A blunt-pointed bistoury, or a pair of blunt-pointed scissors, is the proper instrument to use. Care should be taken that the head is not suddenly forced out during the operation.

Ergot in Obstetric Practice. The use of ergot should be restricted to its employment only after the uterus is completely empty. The practice of using ergot to accelerate labor, or to overcome inertia uteri, should be strongly condemned. While it may not prove harmful in any particular case, there is undoubted danger that the contractions

induced by ergot may become tetanic in character. Should there be some obstruction to the descent of the child, the administration of ergot predisposes to rupture of the uterus. Ergot, however, in a moderate dose has a beneficial action at the completion of the third stage of labor. It is especially valuable after chloroform anesthesia. It is highly important that a reliable preparation of the drug should be used. The fluid extract prepared by Squibbs, or the Ergotole prepared by Sharp and Dohm, is thoroughly reliable. If a preparation of ergot deposits a sediment after standing for a month, it is unreliable and dangerous to use.

Erysipelas in Pregnancy. Erysipelas occurs not infrequently during pregnancy and may be a grave or slight complication. Facial erysipelas may occur without the development of septic infection, while erysipelas of the genital tract, or of the lower extremities, almost invariably results in puerperal infection. The evidence that the fetus is affected by the disease in the mother is not conclusive, although the possibility of the occurrence of fetal erysipelas has been established. Abortion occurs in about 50 per cent. of all cases. The *treatment* is the same as in the non-pregnant state.

Examination, Obstetrical. It is the duty of the attending physician to make a preliminary obstetric examination about the end of the eighth month. Such an examination is a necessity in primiparæ, and in all cases which give a history of

previous difficult labors. In hospital practice both an internal and external examination is made. In private practice all that is necessary to know may usually be determined by an external examination alone. The bladder and rectum should be emptied. The patient lies upon a bed or lounge with the limbs outstretched. The abdomen should be bare or covered only by a sheet. The hands of the examiner are bathed in warm water to render the touch more acute, and to prevent contractions of the abdominal and uterine muscles. Facing the mother's feet the examiner places his hands flat upon the abdomen, upon the two sides of the uterine tumor at its lowest part. With the palmar surfaces of the hands nearly facing each other, the finger tips are gently thrust downward into the brim of the pelvis. If the pelvic brim is filled by the presenting part, the presentation is surely vertex. By gradually pressing the hands nearer and nearer together, the presenting part is grasped between them. The next step in the examination is to locate the back of the child. The whole abdomen is gently palpated with the tips of the fingers. The small parts are felt as small rounded knots, which glide about under the examining fingers. The location of the small parts on one side of the abdomen confirms the location of the back of the child on the opposite side. By gently tapping the sides of the abdomen by the finger tips the increased resistance offered by the back becomes perceptible. By applying one hand over the fundus and pressing downward, the back

of the child is rendered more convex and is within easier reach of the examining hand. The next step in the examination is the location of the fetal heart-sounds. The examiner may use the stethoscope, the phonendoscope, or the ear alone. The most usual location of the fetal heart-sounds is on the left side below the umbilicus, as the left occipito-anterior position of the vertex is by far the most frequent. If the heart-sounds are heard with the greatest intensity on the right side below the umbilicus, the presentation is a right occipito-anterior position of the vertex. If heard best above the umbilicus, the presentation is pelvic. In posterior positions the heart, if heard at all, is found far back over one side of the abdomen. After determining the presentation and position of the fetus, the abdomen should be examined for the presence of any fetal or maternal anomalies that may complicate labor. A pendulous abdomen in a first pregnancy should suggest a possible pelvic deformity.

Hydramnion is recognized by the increased size and tension of the uterine tumor, by unusual mobility of the fetus, and by the presence of suprapubic œdema. The entire abdomen is explored for pathological growths of the pelvic or abdominal organs. A hydrocephalic head should be recognized by external palpation. Twins can often be diagnosed by the unusual size and tension of the abdominal tumor, and the presence of suprapubic œdema. The detection of two fetal heart-beats of different rates makes the diagnosis positive.

The examination is completed by taking the external measurements of the pelvis. *See Pelvimetry.*

Extra-Uterine Pregnancy. *See Pregnancy, extra-uterine.*

Fallopian Tubes, *affections of during pregnancy. See Salpingitis.*

Feeding, Artificial, *of the new-born.*

The best results in artificial feeding of the new-born are obtained by the use of properly modified cow's milk. To render cow's milk as nearly as possible like human milk is the problem to be solved. This requires an increased percentage of sugar and a smaller percentage of albuminoids. The acidity of cow's milk must also be corrected by the addition of lime water. The reduction in the proteid constituents is secured by dilution, but sufficient dilution to reduce the albuminoids to the proper proportion would give a food too poor in fat and sugar to be nutritious. This deficiency must be supplied by the addition of cream and milk sugar. The proteids of human milk are casein and lactalbumin held in suspension, not in solution. The curd of human milk is much finer than that of cow's milk. By diluting cow's milk with oatmeal or barley water a much finer curd can be obtained than by diluting with water. There are objections to the use of starchy preparations in early infancy, but the practical results are often excellent. Sterilization, or pasteurization may be necessary in hot weather, but the digestibility of the food is somewhat lessened by these procedures. The well-known formulæ of Winters,

for the home modification of milk, are the simplest and best formulæ known. The percentages for the first three days after birth are fat, 2.00 per cent.; sugar, 7.00 per cent.; proteids, 0.25 per cent. The percentages of fat and proteids are very gradually increased, while the sugar remains the same. The articles necessary for the proper preparation of modified milk at home are two or three glass jars to set the milk in, a glass syphon, a dairy thermometer, a graduated measure up to eight ounces, and a number of four ounce and eight ounce bottles for feeding. A good supply of rubber nipples and plenty of sterilized cotton are necessary. The greatest cleanliness is absolutely essential, if good results are to be obtained. After each nursing the bottle must be rinsed in cold water and then scalded. The nipple is washed in cold water and thoroughly scrubbed, and both nipple and bottle kept in a soda solution. The amount usually required at each nursing by a new-born child is one ounce. This amount is gradually increased to two and a half ounces at the sixth week, but the amount varies with the size of the child. If the child regurgitates its food unchanged, it is getting too much. If it takes its food eagerly, but seems continually hungry and does not gain weight, a higher percentage of proteid is required.

Condensed milk and proprietary foods are not suitable foods for infants. Condensed milk when sufficiently diluted to give the proper percentage of proteid is deficient in fat, and the sugar with which it is sweetened is cane sugar. The majority

of proprietary foods contain either unconverted starch, or starch converted into maltose or dextrin. They contain an excess of carbohydrates, little if any fat, and proteids which are unlike those in mother's milk.

Fetus, diseases of.

I. Infectious Diseases.

1. *Variola*. Pregnancy may be interrupted as the eruption appears, and the woman be delivered of a dead child not affected by the disease. This is the most common termination. Pregnancy may not be interrupted, and the child is born alive and may be successfully vaccinated. This result is possible only when the disease is exceedingly mild. Pregnancy may be interrupted and the child be born with a full variolous eruption. These cases are rare, but many have been recorded. In the fetus the face is often unaffected by the eruption, while the trunk is thickly covered. The disease may run its course *in utero*, so that the child's body shows cicatrices only. Intrauterine variola is fatal in the majority of cases. The child may survive under exceptional conditions. All pregnant women should be vaccinated when smallpox is epidemic. According to some authorities 33 per cent. of infants are rendered immune by successful vaccination of the mother, while other authorities place the percentage of immunity as high as 60 or even 80 per cent.

2. *Measles*. When a pregnant woman contracts measles, the pregnancy is usually interrupted. The child may present the characteristic rash and coryza.

3. *Scarlatina*. Pregnant women often contract this disease and may or may not abort. The infant may or may not show evidences of the disease.

4. *Erysipelas*. The possibility of the occurrence of fetal erysipelas has been established.

5. *Diphtheria*. A genuine case of intrauterine diphtheria has never been recorded.

6. *Typhoid fever*. Fetal typhoid is a well-established example of ante-natal disease. Typhoid bacilli are found in the fetus and its appendages, and the Widal test applied to the fetal blood has given positive results.

7. *Cholera*. Intrauterine transmission of the disease occurs.

8. *Malaria*. The possibility of fetal malaria is now generally admitted. The plasmodium malarie has never been found in the fetal tissues. The diagnosis depends, therefore, upon congenital hypertrophy of the spleen, associated with debility, wrinkled skin, pallor, etc. The child is usually below the normal in length and weight.

9. *Fetal sepsis*. When the mother is septic, the fetus may become septic by the passage of the septic bacilli through the placenta. Thus fetal pneumonia may occur, when the mother is affected by that disease. Streptococci have been found in the blood and tissues of the fetus in connection with various diseases of the mother. Staphylococci have been found in cases of typhoid fever.

10. *Tuberculosis*. Consumptive women who become pregnant show a marked tendency to abort.

If the pregnancy is not interrupted, the child is usually feeble and small, develops the strumous diathesis, and finally tuberculosis. It is believed that actual tuberculosis is transmitted from the mother to the fetus in an extremely small number of cases. This transmission is possible only when the mother has miliary tuberculosis, and there is some lesion of the placenta which allows the bacilli to enter the fetal blood.

11. *Syphilis*. The effects of the syphilitic poison upon the fetus are specific and non-specific. The specific effects of fetal syphilis appear in the liver and lungs in the form of interstitial changes and miliary gummata. The diaphyses and epiphyses of the long bones are separated by a peculiar linear tract which is of varying breadth, yellow, and irregular. The non-specific effects of fetal syphilis do not differ from those observed in fetuses of women suffering from alcoholism, chronic diseases, and other debilitating conditions. The wrinkled skin and senile look are evidences of prematurity or congenital weakness. If a woman some months pregnant is affected with secondary syphilis of a severe type, the placenta is attacked, and the fetus dies before it has time to be affected by the maternal disease. If the fetus is not killed in a short time, it is rendered profoundly syphilitic and dies from the disease. When expelled it presents a typical picture of fetal syphilis. If such a child is born alive, we have a case of so-called *syphilis neonatorum*, which should be distinguished from infantile syphilis. If the syphilitic germs do

not traverse the placenta, the fetus suffers indirectly from the poisoned condition of the maternal blood, and from the anæmia and malnutrition of the mother induced by the disease. The fetus when born is small and feeble, and contains the germs of the disease. After several weeks the usual symptoms of secondary syphilis develop. This is the type of hereditary or infantile syphilis. In some cases the syphilitic taint does not appear until late in childhood or even until puberty. It is possible for the child to escape infection *in utero* and develop no syphilitic symptoms in after years, although it may present non-specific symptoms. Finally, the infant may escape syphilis altogether.

II. *Acute poisoning.* Chloroform and ether may cause fetal asphyxia. Coal-gas is extremely poisonous to the fetus. Pregnant women who have inhaled this gas and recovered are delivered of dead or macerated children. In cases of acute poisoning with sulphuric acid the skin of the fetus is hard and brown. In phosphorus poisoning the fetus shows the same lesions as the mother. In acute arsenical poisoning the ovum is apparently not affected.

III. *Chronic poisoning.* Chronic lead poisoning causes abortion in 60 per cent. of cases. Children born alive have a high mortality, and show a marked tendency to convulsions and malformations of the head. It is not known whether the lead kills the fetus outright or simply excites labor. Mercury causes a marked tendency to abortion, although its action is less severe than that of *lead*.

Alcohol does not seem to cause abortion frequently, but the child shows a marked tendency to nervous and cerebral disease, malformations, and degeneracy. The effect of morphine upon the fetus is not marked, although it has been recovered from the fetal tissues. It is claimed that the fetuses are likely to require resuscitation at birth.

IV. *Cardiac Diseases.* Endocarditis appears to be common in fetal life. The causes are very obscure. It has been diagnosticated during intra-uterine life through auscultation of the fetal heart. Some authorities believe that what is called fetal endocarditis is really a defect in development. Fetuses with this affection are apt to show malformations in other parts of the body.

V. *Diseases of the Alimentary Tract.*

Fetal peritonitis is said to be a common affection during pregnancy, and is usually accompanied by effusion. The adhesions which form may cause various malformations in the abdominal cavity. Fetal peritonitis may result from hydramnios or syphilis, but in many cases appears to be of idiopathic origin, or from some unknown maternal cause.

Congenital obliteration of the bile ducts is one of the best examples of fetal disease. It may be compared with cirrhosis of the liver in adult life. The bile ducts become obstructed, and jaundice and cirrhosis of the liver results. The fetus is born with jaundice, and the condition is thus one of icterus neonatorum. The exact cause of the disease is unknown.

VI. *Diseases of the Nervous System.*

Internal Hydrocephalus. The cause of this disease is obscure. If it is due to an inflammation of the lining membranes of the ventricles, it is a fetal disease. If it is an effusion of liquid in connection with some defect in development, it should be considered under malformations.

There are a number of defects in the brain which are congenital in origin, and which later in life manifest themselves as deaf-mutism, cretinism, idiocy, and other forms of partial or complete loss of development.

VII. *Diseases of the Uro-Genital Organs.*

Nephritis. The existence of a true intrauterine nephritis has not been fully demonstrated. A further study of the subject in unborn or still-born children is necessary to determine the question.

Hydronephrosis. This condition is due to malformation and cannot be classed as a fetal disease.

Cystic Degeneration of the Kidneys. The nature of this condition is obscure, and its classification depends upon the cause.

The genital organs are subject to malformations rather than diseases.

VIII. *Cutaneous Diseases.* Nævus is the most common congenital tumor of the skin. Aside from nævi the most common fetal disease of the skin is *ichthyosis*. In the congenital form of this disease the skin is covered with horny plates one-sixteenth of an inch or less in thickness. These plates are separated from each other by furrows, which around the orifices may extend into the cutis vera

and consequently bleed. This horny covering, failing to grow as fast as the subcutaneous tissues, bursts and forms deep cracks. Expansion is impossible, so that food cannot be taken. The children are usually premature and survive but a few days, although one case is reported which lived to the age of five months. The only reasonable theory of the origin of this disease is a persistence of the epitrichial layer of the fetal skin.

Keratolysis exfoliativa is a rare condition in which the horny layer of the skin comes away in large thin flakes, leaving a reddened prickle-cell layer. The general health is not affected.

General cystic elephantiasis is another rare congenital disease of the skin in which the subcutaneous tissue is occupied by cysts of various sizes. Of the eighteen recorded cases, only one occurred at term. There is evidently some connection between this condition and multiple pregnancy. It is probable that some disorder of the lymphatic system is the cause of this affection. The swelling is greatest in certain localities, especially in the head and face, and the strange appearance of some of these fetuses has led to the belief that they were monstrosities. The diagnosis of this condition from simple dropsy may at times be difficult. Anomalies of the cord and placenta, commonly found in general dropsy, are rare in cystic elephantiasis.

XI. *Fetal Bone Diseases.* Irregular or imperfect ossification is the underlying condition in all fetal bone diseases. Four types of this condition are

described. The essential feature of the first type is softening of the bones, as shown by the presence of craniotabes and curvature of the long bones. This type is often described as fetal rachitis. The second type shows great fragility of bony tissue, as well as shortening and curvature of the long bones. Schmidt's disease is a name applied to this condition. The third type is characterized by extreme overgrowth of the epiphyses of the long bones. The fourth type affects chiefly the limbs and trunk. The diaphyses of the long bones are reduced in length from a half to a third, while the epiphyses are normal.

X. *Fetal Traumatism.* Injuries occurring during fetal life must be distinguished from traumatism occurring during labor on the one hand, and certain accidents which date from the early formations of the embryo on the other. Fetal traumatism may be divided into wounds of soft parts, fractures, dislocations, and amputations. Scars and circular defects of the skin have been found. The scars are often found over what appear to be badly united fractures, suggesting the possibility of a cutaneous wound at the time of the fracture. The circular defects usually found on the skull are thought to be due to amniotic adhesions. That the fetal bones may be the seat of fracture, and that all the terminations of fracture have been observed at birth without the history of any accident to the mother, is a well established fact. The explanation of these intra-uterine fractures lies in a brittle condition of the bones, or else

in some malformation during the early formative period of the embryo. Dislocations, if recent, probably occur during labor. In other cases, as of the hip, the cause is evidently defective development of structures forming the joint. The joint most frequently involved is the hip, and females are affected four times as often as males.

True intrauterine amputations are very rare. The presence of an amputation stump is necessary to confirm the diagnosis. It has been taught for years that amniotic bands caused these intrauterine amputations, but it is now believed that most of these cases can be explained by a failure of perfect development in early fetal life.

XI. *General Fetal Œdema.* An extremely rare condition in which there exists a general dropsical condition of the fetus with effusion into all the serous sacs. In some cases this fetal œdema depends upon anomalies of the fetal circulation. The tissues are exceedingly friable, and this fact may render a diagnosis possible before delivery in cases requiring a manual or instrumental delivery.

XII. *Maternal Uterine Disease Affecting the Fetus.* Chronic metritis and endometritis have been assigned as causes of fetal death. Prolapse of the gravid uterus and impaction in the bony pelvis may cause abortion. Retro-displacements of the pregnant uterus are prone to produce abortions.

Fever in the Puerperal State not due to Sepsis. As a general rule, fever in the puerperal state is due to infection. There are, however, several condi-

tions which may cause non-infectious fever in the puerperium. *Reflex-irritation* will explain a certain number of these cases. In patients of a neurotic type fever will often develop from some source of pain or discomfort which is purely physical. Congested or engorged mammary glands or a sore nipple often cause fever in patients of this type. When the proper treatment is adopted, the temperature rapidly falls to normal.

Emotion may cause a transient rise of temperature which rapidly falls to normal, when the exciting cause is removed.

Exposure to cold with consequent internal congestion is an occasional cause.

Constipation is a well-recognized cause of fever in the puerperium. The absorption of toxic products of decomposition is partly responsible for the occurrence of fever from this cause.

Fever, Puerperal. See *Infection, Puerperal*.

Fibroid Tumors of the Uterus in Pregnancy.

Fibro-myomata, or fibroid tumors of the uterus, grow rapidly during pregnancy on account of the increased blood supply to all the pelvic organs. The influence of these growths upon the course of pregnancy depends upon their location. The most dangerous variety is the sub-mucous, especially when located near the internal os. Fibroid tumors of the uterus may interfere with the functions of the bladder and rectum, and may alter the position of the uterus, causing abnormal presentations. Pregnancy not only causes a rapid growth in fibroid tumors, but also frequently brings about a

condition of softening and fatty degeneration. On the other hand, fibroid tumors of the uterus, especially in the fundus of the uterus, frequently exist during pregnancy without any appreciable effect upon gestation. The treatment of pregnancy complicated by fibroid tumors is by operation, if interference is necessary. Myomectomy has been performed successfully in many cases without interruption of the pregnancy. Sub-mucous tumors may become pedunculated and present in advance of the fetal head. Premature labor is often the result. The tumor must be removed before delivery can occur. Sub-peritoneal fibroids usually cause no trouble, but may be removed, if necessary. If signs of softening and degeneration appear, hysterectomy should promptly be performed.

Fontanelles, the. The point where two or more sutures of the fetal head meet is termed a fontanelle. The *anterior fontanelle* or *bregma* is found at the point of junction of the frontal, coronal, and sagittal sutures. It is a four-sided diamond- or kite-shaped space and persists during labor, although diminished in size by the approach of the cranial bones. It averages one inch in diameter. The *posterior or small fontanelle*, triangular in shape, is found at the point of junction of the lambdoidal and sagittal sutures. This space does not persist during labor owing to the overlapping of the occiput by the parietal bones.

Lateral fontanelles are occasionally found in poorly-ossified heads and may give rise to errors in diagnosis. *False fontanelles* are occasionally

found either in the line of a suture or in the body of a bone. These false fontanelles are due to imperfect or irregular ossification and may confuse the diagnosis.

Forceps, the. The obstetric forceps consists of two arms which cross like the branches of scissors and interlock. The left arm contains the pin or screw of the lock. The right arm contains a notch for the reception of the pin or screw. Each arm consists of a blade, shank, handle and a portion of the lock. The blades are fenestrated to make them lighter and to give a better grip of the head with less compression. The blade has a double curve, one on the flat to correspond to the convexity of the fetal skull, the other on the edge to conform to the curve of the pelvic excavation. These curves are known as the cephalic and pelvic curves. A good forceps should be made of well-tempered steel; the blades should be well polished and nickel-plated, and heavy enough to be firm. As regards proportions, the fenestræ should be of moderate width (from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches); the tips of the blades should be about 1 inch apart when closed, the greatest distance between the blades at the acme of the cephalic curve being at least 3 inches. The blades should lock easily. The handles may be plain or serrated and should have a convenient shoulder for traction. The instrument should be so constructed that it can be rendered thoroughly aseptic. In England the forceps of Simpson is the most popular; in France, Tarnier's; in America, Simpson's, Elliott's and Tarnier's.

Axis-traction forceps are preferred by many obstetricians for the high forceps operation. By means of axis-traction rods attached to the blades of an ordinary long forceps, the line of traction is made to correspond with the pelvic axis. Tarnier originated the axis-traction forceps, and his axis-traction forceps, or Lusk's modification, is the best instrument of this type.

Action of the forceps. The action of the forceps may be summarized as follows: (1) traction; (2) compression; (3) rotation; (4) leverage, and (5) reflex stimulation of the uterus.

Traction is the main function of the forceps. During traction there is always a certain amount of compression and leverage. Compression should be regarded as a necessary evil rather than a function of the forceps. The amount of compression used should be merely enough for the blades to hold firmly. The instrument should be grasped near the lock, when the traction is applied, in order to reduce compression to the minimum. The forceps should not be used as a rotator under ordinary conditions. In occipito-posterior positions, in the hands of an expert, the forceps may be used to cause rotation of the head, but under any other circumstances the use of the forceps as a rotator is dangerous. Rotation occurring during a forceps delivery is due to the natural mechanism of labor, and not to the action of the forceps. The use of the forceps as a lever is condemned by the best authorities. It may be possible to deliver the head more quickly by leverage, but the possibility

of severe injury to the maternal tissues is so great that the use of leverage is of doubtful utility. The reflex stimulation of the uterus by the application of the forceps is a fact familiar to all. If the blades are cold, this action is still more marked.

Indications for the application of the forceps:

(1) In lingering labor when the natural efforts are unable to effect delivery. (2) When speedy delivery is necessary in the interest of the mother, as in hemorrhage, convulsions, exhaustion, advanced cardiac and pulmonary disease, etc. (3) When speedy delivery is necessary in the interest of the child. Uterine inertia, either actual or relative, is the most common indication for the use of the forceps. The expulsive force is relatively too weak, if the resistance is greater than it can overcome. Hence the forceps is indicated in contracted pelves, rigidity of the soft parts, and overgrowth of the fetal body. It is not always easy to determine when the fetus is in danger. The action of the fetal heart is the best evidence of the condition of the child. If the heart-beat either increases or diminishes steadily, the life of the child is in danger.

Prerequisites and contraindications: (1) The cervix must be fully dilated. (2) The membranes must be ruptured. (3) The greatest circumference of the head must have passed the inlet, and the head must be fixed in the pelvis. (4) The conjugate diameter of the brim should measure at least 3 inches. (5) The fetus should usually be living.

Classification. The forceps operation is divided into the *high*, the *median*, and the *low* operation. A *high* operation is one in which the presenting part is still above the pelvic inlet. A *median* operation is one in which a maximum circumference of the presenting part has passed the plane of the brim. A *low* operation is one in which the presenting part is at or in the vulva.

Preparation for the operation. The bladder and rectum should be empty. The vagina should be douched with an antiseptic solution, and the vulva thoroughly cleansed. The bed should be protected with a clean rubber sheet, and a suitable receptacle arranged to catch the discharges. A Kelly pad is exceedingly useful. The woman is placed in the lithotomy position across the bed, although many operators prefer to place the patient upon a table. The extremities are held by leg-holders or by assistants. Anesthesia is necessary except in the low operation in multiparæ. The management of the anesthetic requires a competent assistant.

Low operation. The left blade, held in the left hand, is first introduced into the left side of the pelvis. Two fingers of the right hand act as a guide, and at the same time protect the maternal and fetal structures. After the left blade has passed into the pelvis, the handle is depressed until it is almost horizontal, and at the same time is carried toward the patient's left. This movement carries the tip of the blade around the fetal head. The right blade held in the right hand is now in-

roduced in a similar manner, two fingers of the left hand acting as a guide. The utmost gentleness must be used in the introduction of the blades of the forceps. The right blade is more difficult to insert than the left, but in the low operation this difficulty is easily overcome after a little experience. The next step is the locking of the blades. This should be accomplished easily, if the blades are correctly applied. A slight movement of adjustment may be necessary, but any considerable difficulty in locking indicates a faulty application. A test traction is now made to determine whether the head is firmly in the grasp of the forceps. Then systematic traction is begun. Traction should be made with the arms and forearms only. Each traction should last about one minute. A rest of one minute should intervene before the next traction. In the intervals between tractions the handles of the forceps should be loosened to avoid undue compression. All haste and excitement should be avoided. The direction of the traction should be downward until the occipital protuberance is beyond the symphysis. Traction is then made in a forward direction until the nape of the child's neck is in the relation with the pubic arch. The forceps are now held in the right hand of the operator, while the left hand protects the perineum. The handles are gradually directed upward until, as the head is born, they rest almost upon the mother's abdomen. Many operators prefer to remove the blades just before the expulsion of the head, and this plan is preferable if the

adaptation is very close. The delivery is completed by pressure upon the fundus. The insertion of one or more fingers into the rectum to facilitate delivery is objectionable and should be avoided.

Median Operation. In this form of forceps operation there are two methods of operating. The forceps blades may be applied in relation to the sides of the pelvis, the pelvic application; or they may be applied to the sides of the fetal head—the cephalic application. The cephalic application offers the better prognosis for both mother and fetus. By this method the compression affects the bi-parietal diameter, which can be safely and readily compressed. In a left occipito-anterior position the left blade is passed well up into the space between the head and the sacro-iliac synchondrosis, and firmly held by an assistant. The right blade is now passed in the same manner between the head and the right side of the pelvis. The right blade is now gently urged forward until it occupies a position near the obturator foramen on the right side of the pelvis. The blades now hold the head in the bi-parietal diameter, and tractions are begun. Traction should be made at first downward and backward according to the height of the head.

Pelvic application. The forceps is applied as in the low operation. One blade rests over the temple and the other over the opposite parietal protuberance. After the head has rotated, the forceps is removed and applied to the sides of the head. The handles should be loosely held between trac-

tions so that rotation may occur. A finger between the head and the symphysis will show how much force is wasted in pulling against the symphysis. The aim should be to keep the head closely applied to the anterior pelvic wall without pressing it against the symphysis. If the head is high, the axis-traction forceps will give better results. If there is disproportion between the head and the upper part of the pelvis, the Walcher position will be of service by increasing the conjugate diameter.

High operation. The patient should be placed upon a table of sufficient height to permit the necessary downward traction. The buttocks should be at the edge of the table. With ordinary forceps the operation is performed as follows: the forceps blades are applied according to the pelvic method. If the head is in the transverse diameter of the brim, one blade will be over the occiput and the other over the forehead. If the head is in the oblique diameter, one blade will be over a parietal protuberance and the other over the opposite coronal suture. The whole hand should be used to guide each blade to its proper positions, great pains being taken to prevent the inclusion of the thin margin of the cervix. After both blades are introduced and locked, a trial traction is made to see if the hold is satisfactory. Systematic tractions are then begun, the left hand of the operator making traction in the line of the handles, while the right hand presses vertically downward over the lock (Pajot's manœuvre). By this means the

head is drawn past the brim. Traction should not last over a minute, and examinations to ascertain progress should be frequent. As the head enters the pelvis the handles of the forceps rise. A careful examination should now be made to determine the exact position of the head. As soon as rotation is apparent, the forceps should be removed and applied by the cephalic method to the sides of the head. This operation is exceedingly difficult, especially if the degree of pelvic contraction is considerable. Many operators prefer to perform version unless the largest diameter of the head has passed the brim of the pelvis. The axis-traction forceps offers great advantages in the high forceps operation and should be preferred when such an operation is undertaken.

Forceps in Occipito-posterior Positions. Forceps should not be used in occipito-posterior positions, unless the life of the mother or child is in danger. Every opportunity should be given for the normal forward rotation of the occiput to occur. When the head is at the brim forceps should be considered as a last resort. In medium cases the forceps should be used with the blades applied to the sides of the head and the tips directed toward the forehead. Traction is made downward and backward, loosening the handles between tractions to allow rotation to occur. When the occiput lies anterior to the transverse diameter of the pelvis, the forceps should be removed and re-applied with the tips of the blades pointing to the occiput. Some authorities advise the rotation of the head with

the forceps in occipito-posterior positions. In the hands of an expert this is possible without danger to mother or child. For the ordinary practitioner, however, it is not an advisable procedure. The solid-bladed forceps is the best instrument to use when rotation with the forceps is attempted.

In low cases of occipito-posterior positions, most authorities advise the delivery of the child with the occiput posterior. The more recent writers advise the application of the forceps with the lock down, reversed forceps, and the rotation of the occiput to the anterior position by the forceps. There is no doubt that the delivery of the child while the occiput is still posterior causes a bad laceration of the perineum in the majority of cases. If the head is delivered with the occiput still posterior, traction should be made downward until the forehead is born; the handles are then raised to roll the occiput out over the perineum, and finally depressed again to deliver the face and chin.

Forceps in Pelvic Presentations. Forceps appear to be indicated in breech cases before it is possible to use the finger or a fillet to produce traction. If the breech is transverse, the blades are applied over the trochanters. The hold of the forceps is not firm so that traction must be slight and made only during pains. Fetal traumatism is very common, and the operation has a very limited sphere of usefulness in these cases.

Forceps to the after-coming head. The forceps should always be ready for use in these cases, but the necessity for their employment rarely arises.

Occasionally a life may be saved. If the head is above the brim, the forceps is positively contra-indicated. The general rule in a vertex anterior case is to apply the forceps below the child. In occipito-posterior positions the forceps is applied above the child.

Forceps to the Detached Head. When the head is left in the uterus either by accident or design, the forceps may be applied. Firm pressure of the head by an assistant is necessary to enable the operator to get a firm hold. Cephalotripsy is a more rational procedure.

Forceps in Face Presentations. The forceps should never be used in face presentations unless the life of the mother or child is threatened. In mento-anterior positions extraction should not be difficult. The handles should be higher than in cranial positions to avoid compression of the fetal neck. Traction should be made in the direction of the handles until the chin is born. Then the handles should be turned strongly upward toward the mother's abdomen, and the head is born by flexion. In mento-posterior positions the forceps is contra-indicated.

Galactocoele. A milk tumor due to the occlusion of one or more lactiferous ducts. The cystic tumor may require puncture, if it attains great size, but may usually be dissipated by heat with pressure or massage.

Galactorrhea. An excessive secretion of milk of poor quality toward the end of a prolonged lactation, and the continuation of the secretion.

after the child has been weaned. The quantity of milk secreted causes exhaustion of the mother. The cause of galactorrhœa is unknown. It may be of nervous origin. The treatment is unsatisfactory. Vigorous compression of the breasts, free action of the bowels, and the administration of potassium iodide have been recommended. Atropine locally (1 gr. to 1 oz. of glycerin) has proved helpful. Electricity often disappoints. In cases of protracted lactation which present the symptoms of debility, loss of appetite, hectic fever, night sweats, etc., study the following remedies: *Calcareo carb.*, *Calcareo phos.*, *China*, *Lycopodium*, *Phosphorus*, *Phosphoric acid*, *Sulphur* and *Silicea*.

For great sense of emptiness in the pit of the stomach from nursing, consult *Carbo animalis*, *Sepia*, *Ignatia* and *Oleander*.

Gavage. A method of feeding premature infants, who are unable to take nourishment in the ordinary way. The simplest method of feeding such infants consists in the administration of the mother's milk or a properly prepared artificial food by means of a medicine dropper or a small glass syringe. In using the method known as gavage, the infant is held horizontally in the nurse's lap. A No. 14 or 16 (French) soft rubber catheter, sterilized, is anointed with a little of the food to be given. The end is introduced into the pharynx and gently passed on into the stomach. When the catheter has been introduced 6 inches, its tip has entered the stomach. From a small glass funnel the food warmed to a temperature of

95° F. is allowed to pass slowly into the stomach. In withdrawing the tube a quick motion is necessary to prevent the milk from following.

Glycerin, Injection of, to Induce Labor. See *Labor, premature, induction of.*

Glycosuria in Pregnancy and in the Puerperium. See *Diabetes in Pregnancy.*

The existence of glycosuria in pregnancy and the puerperium has been known for many years. Glycosuria in the puerperium is undoubtedly a lactosuria due to resorption of lactose. The amount of sugar in the urine fluctuates with the fulness of the breasts. The sugar disappears in a few days. The glycosuria of pregnancy in many cases disappears after delivery and does not recur in subsequent pregnancies. Such cases are explained as due to the special toxemia of pregnancy. In some cases the glycosuria remains, and true diabetes develops.

Goitre during Pregnancy. Exophthalmic goitre and simple goitre may develop rapidly during pregnancy. In cases of exophthalmic goitre pregnancy cures or improves the disease in a small percentage of cases. The large majority are made worse. Patients suffering from exophthalmic goitre should be advised against marriage. If already married, pregnancy should be avoided. If pregnancy is already established it should not be interrupted, unless the heart symptoms are urgent.

Gonorrhea in Pregnancy. Acute gonorrhea is not so frequent during pregnancy, but latent gon-

orrhoea is not uncommon. The symptoms of acute gonorrhoea, such as difficult and painful urination, with burning in the vagina and a profuse purulent discharge, call for an examination. The diagnosis is not complete unless the gonococcus is found. The pathology of this condition during pregnancy is more complex than in the non-pregnant state, as it may cause not only a vaginitis and urethritis, but also abscess of the vulvo-vaginal glands, acute inflammation of the rectum and surrounding tissues, endometritis, and nephritis. Even the fetus may be infected *in utero*. The entire genito-urinary tract is liable to infection.

Treatment. Prompt antiseptics wherever possible constitutes the treatment. Cleanse the vagina from the cervix to the vulva with a large hot douche of boric acid, one drachm to the pint. Then with a speculum distend the folds of the vagina and swab the entire surface with the boric acid solution. Dry the parts with absorbent cotton and apply Protargol, 1 per cent. solution, to every part of the canal. This should be done once daily, and after each treatment a tampon saturated with the Protargol solution should be placed against the cervix. Instruct patient to remove the tampon after six hours. If the urethra is involved the same solution of Protargol should be injected. During labor, in cases where gonorrhoea has existed during pregnancy, antiseptic vaginal douches are advisable. After delivery the child's eyes should be washed with a saturated solution of boric acid, and nitrate of silver be instilled into each eye.

Head, fetal. As the least compressible portion of the fetus the head is the most important factor in the mechanism of labor. A thorough familiarity with the dimensions of the fetal head and with the changes it undergoes during labor is essential to a correct understanding of the mechanism of labor. Obstetrically, the head is divided into two portions, the *face* and the *cranium*. The face is small in comparison with the cranium. The bones which enter into its composition are solid and incompressible. The *cranium* is divided for purposes of description into the *base* and the *vault* of the skull. The base is formed by the basilar portion of the occipital bone, the petrous portions of the temporal bones, the sphenoid, ethmoid, and the orbital processes of the frontal bones. These bones at birth are firmly united and are almost totally incompressible. The vault is composed of the parietal bones, and the squamous portions of the occipital, temporal, and frontal bones. All these bones are wide, flat, and slightly curved. They are united at their edges by membranous commissures. Thus the vault of the cranium can be safely and easily compressed during labor with marked alteration in shape. The membranous lines of union between the bones of the vault are known as *sutures*. The suture between the frontal bones is the *frontal*; that between the frontal and parietal bones, the *coronal*; that between the parietal bones, the *sagittal*; and that between the occiput and the two parietal bones is the *lambdoidal* suture. The size of the fetal head varies greatly

with the size of the fetus, but the dimensions of the average fetal head are fairly constant. The diameters of the fetal head which are commonly described are as follows:

1. The *occipito-mental diameter* is the greatest distance from the center of the chin to a point on the posterior extremity of the sagittal suture.

2. The *occipito-frontal diameter* is measured from the occipital protuberance to the root of the nose.

3. The *sub-occipito-bregmatic diameter* is drawn from the junction between the occiput and the neck to the center of the anterior fontanelle.

4. The *bi-parietal diameter* is the widest distance between the parietal protuberances.

5. The *bi-temporal diameter* is the distance between the anterior ends of the coronal suture.

6. The *bi-mastoid diameter* is the widest distance between the mastoid processes.

7. The *fronto-mental diameter* is measured from the summit of the forehead to the centre of the chin.

8. The *cervico-bregmatic diameter* extends from the junction of the chin and the neck to the centre of the anterior fontanelle. The lengths of the several diameters are as follows:

Occipito-mental.....	5½ inches.
Occipito-frontal.....	4½ inches.
Sub-occipito-bregmatic.....	3¾ inches.
Bi-parietal.....	3¾ inches.
Bi-temporal.....	3¼ inches.
Bi-mastoid	3 inches.

Fronto-mental	3½ inches.
Cervico-bregmatic.....	3¾ inches.

A comparison of the diameters of the fetal head with the diameters of the pelvis is interesting and instructive in connection with the mechanism of labor. A section through the occipito-mental and bi-parietal diameters gives the greatest circumference of the fetal head, 15 inches. This circumference presents at the pelvic brim in vertex presentations when complete extension of the head obtains. This circumference is too great to pass the inlet of the pelvis. A section through the occipito-frontal and bi-parietal diameters has a circumference of $13\frac{3}{4}$ inches. This circumference presents when the head is midway between flexion and extension. This circumference may pass the pelvic inlet, but only with great difficulty. A section through the sub-occipito-bregmatic and bi-parietal diameters is the smallest of all the head planes. This plane is nearly circular in shape, and is capable of passing any diameter of the pelvis. This is the cross-section which always presents when the head is well-flexed. The circumference of this section, after moulding of the head, is 11 inches.

Heart, Diseases of, During Pregnancy and Labor. Organic disease of the heart is capable of causing the most serious complications during pregnancy and labor. On the other hand organic heart disease may be borne by the pregnant woman with little or no discomfort. These differences depend mainly upon the nature and location of the valvular lesion, upon the compensation, the

quality of the blood, and the functional activity of the kidneys. Mitral lesions, especially mitral stenosis, are the most dangerous and the most common. Direct cardiac symptoms consist mainly of palpitation associated at times with pain and depression about the heart. Bronchial catarrh is usually present. Mitral stenosis is not apt to be well compensated, hence there is an increased tendency to pulmonary congestion and stasis in the right side of the heart. Failure of compensation is seen more frequently during the latter half of pregnancy. In pronounced cardiac affections during pregnancy the gestation may be interrupted at any time from physical and mental influences which, under normal conditions, would be perfectly harmless. The *prognosis* of organic heart disease is unfavorable for both mother and child, although with proper care many cases will terminate favorably.

Treatment. The treatment should be symptomatic, bearing in mind the fact that symptoms of obstruction are apt to develop more rapidly and may prove more quickly fatal than in the non-pregnant state. The avoidance of overexertion and excitement is of the highest importance. The amount of fluid taken should be restricted, if symptoms of failing heart action appear. The indicated Homœopathic remedy should be carefully chosen and allowed to act so long as conditions do not change for the worse. The heart tonics like Digitalis, Strychnia, Strophanthus, Nitroglycerin, etc., should be reserved for emergencies. Cactus

grand. and Arsenicum are remedies which often prove helpful. Glonoine, Ignatia, Lachesis, and Spigelia will often remove many troublesome symptoms. In the majority of severe cases, however, one of the heart tonics will usually be necessary to relieve the patient. Edgar finds the free use of Strychnin of great help in these cases.

For the pulmonary congestion consult Antimon. tart., Ipecac, Sambucus, Sanguinaria canadensis, or Phosphorus. When the cardiac compensation has absolutely failed, and heart tonics give but temporary relief, the induction of premature labor must be considered. In labor, anesthetics should be used with caution, ether being preferred. Syncope should be guarded against by the application of the abdominal binder before delivery, and its gradual tightening as delivery proceeds. Dilatation of the cervix should be hastened by stretching with the hand, and delivery shortened as much as seems advisable by the use of the forceps.

Fatty degeneration of the heart muscle is sometimes observed in women who have had repeated pregnancies in rapid succession. It may also occur as the result of the toxemia of renal disease, or of septic infection. Sudden death during or shortly after delivery may occur in these cases.

Heart-sounds, Fetal. The fetal heart-sounds furnish the most reliable proof of pregnancy. These sounds may be heard by a skilled observer as early as the middle of the fourth month. There are two sounds, the first and second, separated by a slight interval. The position or point of greatest inten-

sity of the fetal heart-sounds varies with the position of the child. In head presentations the fetal heart is most frequently heard at a point half way between the umbilicus and the left anterior superior spine of the ilium. If the breech presents, the fetal heart is heard above the umbilicus. The sounds are transmitted through the back of the child, except in some cases of face presentations. The fact that the fetal heart is not heard does not negative pregnancy. The child may be dead, or the sounds for a time inaudible; the maternal abdominal walls may be very thick and fat; the fetal back may be posterior. The rate of the fetal heart is from 130 to 150 beats a minute. It is slightly more frequent in small than in large children. Little reliance can be placed upon the rate of the fetal heart as an indication of the sex of the child. When the fetal heart-sounds are distinctly heard, but the uterus is too small to contain a fetus of five or more months' development, there is a strong indication of extra-uterine pregnancy. In searching for the fetal heart-sounds it is advisable to make pressure over the fundus uteri in such a manner that the back of the fetus is brought into close contact with the anterior abdominal wall.

Hegar's Sign of Pregnancy. See *Pregnancy, signs and symptoms.*

Hematoma. A rare complication of labor and the puerperium. The blood tumor does not usually appear until after delivery, although it may be present during labor. The cause of the condition is the rupture of one or more veins under the

strain of increased venous pressure during labor. When the vessel ruptures early, and the presenting part has not advanced sufficiently to make direct pressure upon the veins, the tumor forms rapidly and may obstruct labor. Usually the tumor does not appear until after delivery, owing to the fact that pressure of the presenting part during labor prevents its formation. The situation of the tumor varies. Usually the blood is effused below the pelvic fascia, and the tumor appears in the labium, or beneath the vagina, or in the perineum. If the bleeding has occurred above the pelvic floor, the tumor will form in the broad ligaments, in the periuterine connective tissues, or the blood may be free in the abdominal cavity. Clinically the usual site of the swelling is at the side of the vagina near the vulva. The possible terminations of a hematoma are absorption, recovery after evacuation of its contents, septic infection before or after rupture, hemorrhage which may prove rapidly fatal before rupture or at the time of rupture.

The treatment. If the swelling occurs during labor and obstructs delivery, a free incision should be made at the most dependent portion of the tumor to favor subsequent drainage. Bleeding can be controlled by manual compression, or by ligature of the bleeding vessels. If the hemorrhage is difficult to control, draw the head into the vagina with forceps, thus controlling the hemorrhage by pressure. Even when the tumor is not large enough to obstruct labor, it is good treatment to anesthetize the patient and apply forceps,

if conditions are favorable. Such a course prevents further bleeding and an increase in the swelling. If the swelling first appears after labor, an attempt should be made to control the hemorrhage by the application of cold, and by pressure. The largest Barnes' bag filled with ice-water may be inserted into the vagina, and ice poultices placed against the labium. If the swelling ceases to enlarge and does not become larger than one's fist, efforts should be made to promote absorption. Compresses wet with lead-and-opium wash, or diluted alcohol, are useful. The vagina should be douched daily with an antiseptic solution, and all efforts at straining must be avoided. After a few days, if there are no signs of absorption, and if the tumor, which had been hard, begins to soften, and the overlying skin or mucous membrane is tense, discolored, or vesicated, an incision should be made along the inner surface of the labium, the clots evacuated, and the cavity cleansed daily and packed with antiseptic gauze. When symptoms of internal bleeding point to a hematoma within the pelvis, the condition must be differentiated from hemorrhage in the peritoneal cavity. The latter condition demands an immediate abdominal operation. In hematoma the hemorrhage is confined within the connective tissue. No attempt should be made to evacuate the tumor at the time of its formation. If there is no evidence of absorption after several days, evacuation through the vagina is the best treatment.

Hematuria in Pregnancy and in the Puer-

perium. Hematuria, or bloody urine during pregnancy is usually due to passive engorgement of the veins of the bladder. Other possible causes are acute nephritis, or cystitis, calculi, new growths, or traumatism of the bladder. The treatment should be directed to the cause. As congestion of the pelvic vessels is the most frequent cause, the relief of constipation and the avoidance of tight clothing are helpful measures.

Hematuria during the puerperium is also due in many cases to pelvic congestion. It may be due to injury from pressure of the child's head or from instruments, or the result of a vesico-vaginal fistula. The differential diagnosis is made by the history. The blood in the urine usually disappears spontaneously in a few days when its presence depends upon passive congestion. When there has been an injury to the bladder, especial antiseptic care is necessary, if the use of the catheter is required.

Hemorrhage, Accidental. Accidental hemorrhage is a term used to designate the hemorrhage resulting from premature detachment of the placenta occupying its normal site. The separation may be partial or complete, the former variety being far more common. Contractions of the uterus may or may not be present.

Etiology. The causes of accidental hemorrhage are often obscure. Among the *predisposing causes* are profound anemia, persistent pelvic congestion, prolonged gestation, multiparity, the loose attachment of the placenta toward the end of preg-

nancy. It is questionable whether accidental hemorrhage can ever occur with a healthy placenta and uterus; some diseased condition, such as syphilis, uterine inflammation, or nephritis, is a necessary predisposing cause. Endometritis appears to be the predisposing cause of greatest frequency.

The *exciting causes* include traumatism of various kinds, direct and indirect profound emotion, short cord, and hydramnios.

Symptoms and Diagnosis. The bleeding is internal or external. In the external variety the diagnosis is plain. If the hemorrhage is internal or concealed, the diagnosis is more difficult. The blood may collect between the placenta and the uterine wall, separation occurring only in the middle portions of the placenta. More commonly the placenta separates also at its margin, and the blood collects between the uterine wall and the membranes. The symptoms of the concealed variety are chiefly extreme collapse and exhaustion with no apparent cause. Usually after a longer or shorter time blood escapes externally, but the constitutional symptoms are much more severe than the amount of blood visible would account for. There may be a complete absence of labor pains. If present, they are irregular and feeble. The uterus is excessively sensitive, and there may be a rapid increase in the size of the uterus, the patient complaining of excessive distention. The fetal heart-sounds are irregular and feeble. There is extreme pallor of the patient's face, the body is covered with perspiration, and the extremities are

cold and clammy. The pulse is small, compressible and rapid. The differential diagnosis between accidental hemorrhage and placenta previa is made by actually palpating the placenta in the latter condition. Rupture of the uterus, or a ruptured extrauterine pregnancy are conditions which may require differentiation from accidental hemorrhage.

Prognosis. The prognosis of accidental hemorrhage is bad for the mother and still worse for the child. The prognosis is better for the mother when the hemorrhage is external, and when the patient is a multipara. The death of the child is due either to hemorrhage from the fetal portion of the placenta, or to asphyxiation.

Treatment. If the hemorrhage occurs during pregnancy, and is not severe, the treatment is practically that of threatened miscarriage. If there has been a copious hemorrhage which has ceased, treatment should be directed to the prostration. The patient should be carefully watched, and every preparation made for active interference. If the hemorrhage is severe and persistent, the uterus must be emptied and firm contraction secured in the speediest and safest manner possible. If speedy dilatation of the os is possible, the membranes should be ruptured, and repeated injections of ergot should be administered to excite contractions. A firm abdominal binder will limit the amount of blood which may collect in the uterus. When the os becomes sufficiently dilated, delivery should be hastened either by forceps or

by internal podalic version. The choice between these operations depends upon which can be most rapidly done in the individual case. Speed in delivery is the main consideration. Some writers advise the use of the vaginal tampon in cases in which the os cannot be speedily dilated. This use of the tampon must be limited to mild cases, and the danger of internal bleeding must ever be borne in mind. Craniotomy may be necessary, if there is much delay in the delivery of the head, and Cesa-rean section has been recommended. If the patient is in collapse when first seen by the physician, it is best to revive her before operative measures are undertaken. The use of salt solution by hypodermoclysis, by rectal and intravenous injection, is extremely valuable in counteracting the effects of the loss of blood.

Hemorrhage, concealed, *see Hemorrhage, accidental.*

Hemorrhage, post-partum. Severe bleeding after the child is born may be caused by lacerations of the cervix, vagina, or the external sexual organs; it may be the result of rupture or inversion of the uterus. The term, post-partum hemorrhage includes only hemorrhage from the uterus not resulting from lesions or displacements of that organ. Post-partum hemorrhage is *primary*, when it occurs within twenty-four hours after delivery. It is *secondary*, when it occurs at any time during the puerperium subsequent to the first twenty-four hours. Post-partum hemorrhage may be *internal or concealed*, or *external*.

Frequency. This complication occurs in a mild form once in fifty labors; is severe, once in 1000; and fatal once in 5000. *Etiology.* The great cause of post-partum hemorrhage is lack of firm contraction of the uterus after delivery. Among predisposing causes may be mentioned the hemorrhagic diathesis, certain conditions of the mother's blood, as albuminuria, severe malarial poisoning, and alcoholism. Affections of the heart, liver and lungs, which obstruct the return circulation, are predisposing factors. Precipitate or protracted labor, and over distention of the uterus as in multiple pregnancies and hydramnios; degenerations and fibroid tumors in the muscular walls of the uterus; or malpositions of the organ, partial or complete inversion, favor post-partum hemorrhage.

Exciting causes. First and foremost, is the improper treatment of the second and third stages of labor. Too rapid emptying of the uterus, and the excessive use of anesthetics, and attempts to hurry labor by uterine compressions and excessive voluntary efforts on the part of the patient, are the main errors. Mental emotions and sudden muscular effort, as in coughing, laughing, vomiting, etc., have been known to cause post-partum hemorrhage. Any condition which hinders or prevents complete contraction of the uterus may be an exciting cause. A distended bladder or rectum, the retention of the placenta, membranes or clots, or new growths of the uterus, adherent placental tissue, a large pyosalpinx, hydrosalpinx, or pelvic

exudate may be the exciting cause of a post-partum hemorrhage. Placenta previa is a possible cause. The lower segment of the uterus has not the contractile power of the upper portion of the organ, hence the closure of torn blood-vessels is not so prompt and complete.

Symptoms. Frequency of the pulse-rate and decreased force are the common premonitory symptoms, and should always demand a careful examination of the uterus and the discharge. The patient may complain that she feels faint and that something is flowing away from her. An examination may show but little blood escaping or a profuse flow. The uterus on palpation is found to be soft and flabby, or in severe cases cannot be felt at all. The fundus may be at or above the umbilicus, and blood-clots can be distinguished as hard, irregular prominences, which shift about under the examining hand. In severe cases the patient's face becomes deadly white. She complains of "ringing in the ears" or dim sight, saying that "the room is getting dark." The pulse is feeble and frequent; the respiration shallow; the skin is cold and bathed in perspiration. She craves air and wants to be fanned, and is extremely restless.

Diagnosis. Usually plain, especially when the bleeding is external. The concealed variety may give rise to errors in diagnosis. Careful physical examination together with the general symptoms, should render the diagnosis clear.

Prognosis. The prognosis is doubtful. It is

graver the earlier the bleeding occurs. If the blood is like serum, not clotted, there is immediate danger of death. Pain in the back is an encouraging sign, as it indicates some uterine activity. The prognosis is more dangerous in the internal variety.

Treatment, Preventive. It cannot be asserted too strongly that post-partum hemorrhage in the vast majority of cases is a preventable accident. The fact that severe post-partum hemorrhage is of rare occurrence in hospital practice shows that its far greater frequency in private practice depends upon lack of care in the management of the second and third stages of labor. In all cases the hand of the physician or a competent assistant should be held on the abdomen over the uterus from the moment the child is born until the placenta is expelled. The most careful watch of the condition of the uterus should be maintained for one hour afterward. If there is any tendency to relaxation of the uterus, a drachm of the fluid extract of ergot should be administered. The pulse should be carefully watched, and the patient should be kept under observation until the pulse falls below 100. A firm abdominal binder with a compress above the uterus, and the application of the child to the breast within three hours after delivery are additional measures of safety.

Curative Treatment. The proper treatment of post-partum hemorrhage must be so familiar to the physician who practices obstetrics that no time may be lost. The first important principle of

treatment is to secure uterine contraction. Friction of the uterus by the hand may be sufficient to cause slight contraction. Then the fundus is grasped with the fingers behind and the thumb in front as in the Credé method for expelling the placenta. Compression made in this manner expels clots and thus aids contraction. The abdominal aorta may be compressed at the same time. If this method fails to control the hemorrhage, one hand is inserted into the uterus to clean out clots or fragments of placenta, and the uterus is compressed between the outer and inner hands. Another method of compression consists in compressing the fundus with one hand, while the other, tightly closed, occupies the uterine cavity. If these measures fail to arrest the hemorrhage, the uterine cavity should be douched with hot water, either plain, or with the addition of 1 per cent. acetic acid. The injection should consist of one quart at a temperature of 120° F. In an emergency vinegar may be used in place of the acetic acid. If the douche is ineffectual, the uterine cavity and vagina must be tamponed with sterile gauze. The tampons should be removed in six hours. The anemia and shock are treated by elevating the foot of the bed, and bandaging the patient's arms and legs. Warm salt solution is introduced into the rectum and subcutaneously beneath the breasts. Feeding must not be neglected. At first sips of brandy and black coffee every fifteen minutes; after some reaction has begun, beef-juice, panopeptone, mutton broth, etc. Stimulants

should be used with caution owing to their tendency to cramp the heart under these circumstances. The indicated Homœopathic remedy, which will be *China* in the majority of cases, should be administered, and absolute quiet enjoined.

Hemorrhage, puerperal. Puerperal hemorrhages are those occurring any time from twenty-four hours after the completion of labor until the period of involution is complete. When it is noted that the bloody lochia are excessive and prolonged beyond the third day, an investigation should be made at once, as the proper treatment of the case depends upon accurate determination of the cause. The local causes of puerperal hemorrhage, arranged in the order of their frequency, are: (1) Retained secundines and blood-clots; (2) displacement of the uterus; (3) displaced thrombi; (4) relaxation of the uterus; (5) fibroid, or polypoid tumors; (6) hematomata; (7) pelvic engorgement; (8) secondary hemorrhage from laceration of the cervix, vagina, or vulva; (9) malignant disease, especially carcinoma.

The most frequent cause of puerperal hemorrhage is the retention of a portion of the placenta or membranes. Such a retention may be suspected, if the lochial discharge is normal at first, but becomes profuse after ten or fourteen days. Should a large blood clot be retained *in utero*, the bloody flow may almost cease; within a few days there may be a sudden discharge of disintegrated, followed by bright, blood in sufficient quantity to

cause the death of the patient. The so-called placental and decidual polypoid tumors are really layers of blood or fibrin deposited upon fragments of the secundines. These fibrinous formations may in rare cases become malignant. Uterine displacement may be caused by over-distended bladder, prolonged dorsal position, getting up too soon, or sudden muscular effort. Backward displacement is the most common. An abnormal flexion of the uterus will cause a retention of the secretions until putrefactive changes occur. As a result there is elevation of temperature, rapid pulse, and other signs of putrid absorption. Displaced thrombi may occur as a result of rapid heart action and high arterial tension following labor, or as a result of septic disintegration of the thrombi formed in the uterine sinuses. Simple uterine relaxation rarely occurs after the third day and is usually caused by the retention of secundines. It may possibly occur in women of lowered vitality and muscular weakness. Fibroid tumors are liable to cause excessive and prolonged red lochia and may produce violent hemorrhage. Hematoma has already been discussed. Active or passive pelvic congestion may be a cause of puerperal hemorrhage. A return of the bloody lochia for a few days after getting up is a physiological example of this effect of pelvic congestion and should cause no alarm. If the bleeding is prolonged beyond a few days, some pathological condition should be suspected, such as subinvolution with uterine displacement, some disease of the adnexa, or a too

early resumption of sexual intercourse. Other causes are an accumulation of fecal masses in the rectum, an intrapelvic tumor, or disease of the liver, kidneys or heart, which may result in passive pelvic congestion. Rare cases have been recorded of secondary hemorrhage following lacerations especially of the vagina. Hemorrhage from malignant disease is rare, as malignant disease of the uterus usually prevents conception. Digital examination will make the diagnosis of malignant disease of the cervix clear, and the hemorrhage may be controlled by a vaginal tampon. Cancer in the body of the uterus complicating the puerperium is also rare. Complete extirpation as soon as possible after delivery is the only rational treatment. Among other conditions which may in rare instances cause puerperal hemorrhage should be included profound emotion, syphilis, chlorosis, scurvy, nephritis, and malaria. The constitutional diseases doubtless cause hemorrhage through changes in the blood which prevent the formation of clots.

Treatment. The *preventive* treatment is of the utmost importance. The puerperal woman should be protected against mental emotions, disturbances of the circulation, and blood conditions, which might cause hemorrhage. If the third stage of labor and the first days of the puerperium are properly managed, there will be avoided the retention of placental tissues, membranes, or blood clots, and a distended bladder or rectum. The patient should be kept quietly in bed until involu-

tion is complete. The *curative* treatment consists in making sure that the uterus is completely empty and in securing complete contraction. A vaginal examination should be made and the uterine cavity explored with the finger. If the cervix will not allow of the passage of the finger, the cervical canal must be dilated and the interior of the uterus examined. If the bleeding does not stop after complete evacuation of the uterus, swab out the uterine cavity with a 2 per cent. acetic-acid solution, or irrigate with hot water, at a temperature of 110° F. If irrigation is used, use a return-flow tube, or be sure that dilatation is ample to allow the water to return easily. Ergot may prove beneficial in cases of subinvolution. If relaxation of the uterus is the cause, packing the uterine cavity with gauze is the best treatment. Meet the general symptoms with rest, carefully selected diet, and the indicated *Homœopathic* remedy. When continued hemorrhages are not relieved by the curette, and are not traceable to constitutional disturbances or to evident local causes, the possibility of malignant diseases should be considered, and the scrapings should be subjected to careful microscopical examination.

Hemorrhage, umbilical. There are two kinds of hemorrhage from the umbilical vessels—one occurring before, and one after, the separation of the cord. The first variety may occur if the ligature is not properly tied. However, no hemorrhage may follow in the absence of a ligature. If the child cries lustily at birth, a small amount

of blood flows from the fetal end of the divided cord. After a short time this slight hemorrhage stops. If, however, the respiration is imperfect, then the umbilical vessels remain filled with blood, and imperfect ligation of the cord would usually result in profuse hemorrhage. The second variety of umbilical hemorrhage occurs at the time when the cord separates. The hemorrhage in these cases consists of a general oozing of blood from the umbilical stump. The blood shows little tendency to coagulate. When the hemorrhage is not fatal, spontaneous arrest within a few hours or days is the rule. This hemorrhage is often accompanied by slight icterus, sometimes vomiting and colic, and bloody discharges from the stomach and bowels. In severe cases cyanosis and drowsiness show the marked constitutional disturbance. Death may occur in a few hours, or the patient may live two or three weeks. The prognosis is extremely grave. Death often occurs after the vessels have been completely ligated. The causes of this form of umbilical hemorrhage are not fully known. It is evident that hemophilia is not the only cause. Syphilis and sepsis are believed to be efficient causes in some cases, while other authorities attribute the hemorrhage to the invasion of a micrococcus.

Treatment. The best treatment is ligation of the navel according to Dubois' method. A hare-lip pin is passed along the edge of the umbilical wound from left to right in such a way that the skin only is traversed by the pin. By means of a

thread passed beneath the pin, the navel is now raised, and a second pin is passed under the first pin, and at right angles to it, through the abdominal wall. A figure-of-8 ligature is passed around the second pin, and, finally, around the base of the navel. This method has been successful in a few cases.

Hemorrhoids in Pregnancy. Hemorrhoids are common during pregnancy on account of the general pelvic congestion, and the direct effect of uterine pressure. Treatment should be directed toward the constipation which usually exists. The local application of witch-hazel oil is helpful. The Homœopathic remedies which are commonly indicated are *Æsculus*, *Aloes*, *Capsicum*, *Collinsonia*, *Hamamelis*, *Ignatia*, *Nux vomica*, *Podophyllum*, *Sepia*, *Silicea*, *Sulphur*.

Hemorrhoids, puerperal. Pregnancy may cause such a congestion of the rectal veins that hemorrhoids persist after labor and cause severe pains. The regulation of the bowels, and the local application of witch-hazel oil usually afford relief.

Hernia in the Infant. In infants the inguinal canal is straight and short, and hernia is not uncommon. Tight bandaging with the ordinary belly-band is a probable cause in some cases. Knitted bandages are most comfortable and useful. A properly-fitting truss will cure the majority of these cases. Umbilical hernia is often observed in poorly developed children when there is a large cord. A compress, or a disk of metal, larger than the protrusion should be applied and held in posi-

tion by adhesive plaster. Some use a covered wooden button with good results.

Herpes in Pregnancy. Herpes is one of the interesting disorders of the nervous system to which the pregnant woman is liable. The lesions are extremely varied in character. They consist of erythematous patches, sharply defined, without scales or infiltration. Papules which are small and pale, capped with blood crusts, or larger papular lesions, red, pointed, and hard. Vesicles may appear on the patches of erythema or on the papules. Lastly large bullæ may appear on the patches of redness. The common sites of the eruption are the buttocks, backs of the thighs, flanks and forearms. The mucous membranes are never attacked. The lesions itch furiously, appear in successive crops, and leave deep pigmentation. Insomnia from the irritation may seriously depress the nervous system. The disorder is essentially a neurosis. It follows shock and depressing conditions generally. It is a rare complication of pregnancy. In the treatment of this disorder the rest treatment, Arsenic, and Sulphur, in the form of a 10 per cent. ointment, are recommended. Some of the Homœopathic remedies for this disorder are *Apis*, *Arsenicum*, *Mezereum*, *Ranunculus bulbosus*, *Rhus tox.* and *Sulphur*.

Hydatiform mole, *see Chorion, diseases of.*

Hydramnios, *see Amnion, diseases of.*

Hydorrhœa gravidarum, *see Endometritis.*

Hydrocephalus. This condition is rare, occurring once in about 3,000 deliveries. The cause of

hydrocephalus is not positively settled. The diagnosis is not always easy, and the condition is seldom recognized during pregnancy. At the time of labor the diagnosis is made by the introduction of the whole hand into the vagina. An anesthetic is often necessary. By palpation we may distinguish the wide-open fontanelles, the great width of the sutures, fluctuation, and the extreme size of the head. Hydrocephalus should always be suspected if the head remains above the brim, although the pelvis is normal in size and no good reason can be found for non-engagement. The prognosis in these cases is always grave. If the complication is recognized early enough, the outlook for the mother is not so bad. Rupture of the uterus is not at all uncommon. Vesico-vaginal fistula may result from the pressure of the fetal head. In vertex cases labor can end only by spontaneous or artificial rupture, or puncture of the head.

The *treatment* of this complication of labor is puncture of the cranium with a perforator and the evacuation of the fluid. The cranial bones then collapse, and the pains are generally sufficient to deliver the child. If there is much delay the cephalotribe may be used to complete the delivery. Forceps should not be used, as the blades are too short and the cephalic curve is not large enough. In breech cases labor is normal until the head reaches the pelvic brim. The chances are more favorable for delivery than in a vertex presentation, but perforation of the skull is often necessary. French obstetricians remove the fluid by puncturing the spine.

Hygiene of Pregnancy. The thorough preparation of the pregnant woman for the final act of parturition is highly important. Physicians should instruct their patients to place themselves under the physician's care as soon as pregnancy begins, and definite rules should be given for the patient's guidance. Advice should be given regarding exercise, clothing, diet, care of the bowels, skin, kidneys, breasts, teeth, and the danger-signals of approaching complications.

Exercise. A moderate amount of exercise is very beneficial. Walking is the best form of exercise, as more violent exercise may cause harm. All violent exercise should be forbidden, and long journeys by land or water should be postponed.

Diet. There is no good evidence that any special kind of diet is of importance in normal cases. The diet of a pregnant woman should be plain, simple, easy of digestion, highly nutritious, and taken at regular intervals; meats, vegetables and fruits should be included. The longings of the patient in the early months for certain articles of diet should be respected. During the latter part of pregnancy the meals should be smaller, but the intervals between meals should be shorter. The drink should be water, milk or chocolate; tea and coffee may be taken in moderation, but should not be strong.

Bowels. The bowels should be carefully regulated by the free use of pure water and proper food. Coarse cereals, Graham bread, and the liberal use of fresh fruit aid the action of the bowels. The appropriate and carefully chosen Homœo-

pathic remedy is helpful. Some cases will require a mild laxative or an occasional enema to relieve constipation. The habitual use of drugs or enemas should be avoided.

Fresh air. The pregnant woman requires an abundance of fresh air. Crowded rooms should be avoided, and thorough ventilation of the living and sleeping rooms must be secured.

Rest. An abundance of restful sleep is essential. If possible the patient should rest in the recumbent position for an hour or two after the mid-day meal.

Bathing. The care of the skin should receive particular attention, as the eliminative function of the skin is often called into play to relieve the over-taxed kidneys. Baths should be taken daily in warm weather and twice a week in cold weather. Reaction should be secured by friction with a coarse towel.

Clothing. The clothing is best suspended from the shoulders. Corsets and tight-fitting skirts are harmful, and the clothes should be as light as possible. Multiparæ with relaxed abdominal walls may be made more comfortable by the use of a suitable binder.

Leucorrhœa. Vaginal douches may be necessary to relieve leucorrhœal discharges. A saturated solution of boric acid makes a useful injection for this complication. A fountain syringe should be used, and the force of the current should be very gentle. Other useful injections are those of alum, a tablespoonful to a quart of water; of acetate of

lead and sulphate of zinc, each half a teaspoonful in one or two quarts of water.

Breasts. There must be no pressure upon the mammary glands. The nipples must be kept absolutely clean. Exposure to the air daily, tends to diminish the sensitiveness of the nipple. The application of cacao-butter or lanoline to the nipple, during the last month of pregnancy, makes the covering of the nipple more flexible and less liable to crack. Astringent applications are not advised.

Mental condition. The mental condition of the pregnant woman requires especial care. Increased emotional susceptibility is the rule, and the patient should be carefully guarded from worry, shocks and surprises. Large gatherings, such as the church or the theatre, should be avoided, but judicious amusement should be provided and cheerful and agreeable companions. Great allowance should be made for the whims and irritability of the pregnant woman. It is probable that much of this irritability is due to changes in the blood and in the sexual organs resulting from pregnancy. The patient should therefore be treated with considerate kindness, and her whims and moods should be gently over-looked.

Examination of Urine. The urine of a pregnant woman should be examined once a month from the third to the seventh month. From the seventh to the ninth month, once in two weeks. The patient should be instructed to report at once any marked decrease in the amount of urine

excreted. The total quantity of urine in twenty-four hours must be known, and the examination should include the specific gravity, the quantity of urea eliminated, and the presence or absence of albumin and casts.

Hysterectomy for Puerperal Sepsis. *See Infection, puerperal.*

Hysteria in Pregnancy. Hysteria is more or less common during pregnancy. The mental balance is rendered unstable by the existence of pregnancy, and exceedingly slight causes may provoke an hysterical attack. Mild forms of hysteria take the shape of melancholia and dread of approaching confinement. Hysterical attacks during pregnancy become dangerous when a condition of maniacal excitement ensues. Such cases require constant watchfulness, kind and systematic restraint, and, when any obstetric manipulation is necessary, the use of anesthetics. Moral suasion is far more effective than drugs in the treatment of these cases, but the indicated Homœopathic remedy will afford marked assistance.

Icterus gravidarum, *see Toxemia of pregnancy.*

Impressions, maternal. Much has been written during the last fifty years upon this interesting topic. Up to the beginning of the eighteenth century, the opinion was almost unanimous that fetal marks and deformities were due to impressions received by the mother. The trend of modern thought is strongly opposed to this theory of maternal impressions. Two of the strongest arguments against the theory are the lack of any

direct nervous connection between mother and child, and the fact that the alleged cause of the malformation occurred at a period of gestation, which does not correspond to the developmental period of the part affected. One of the ablest articles upon this subject takes the ground that traditional superstition has perpetuated the notion, and that the medical profession is in no inconsiderable degree responsible for its continuance. The whole subject is in an uncertain state, but the weight of opinion at the present time inclines to the belief that there is no actual relationship of cause and effect between maternal impressions and anomalies of the child.

Infant, new-born. The new-born child weighs, upon the average, seven pounds. For two or three days after birth there is a loss in weight of from three to six ounces, but at the end of the first week the child should weigh as much as it did at birth. The increase in weight after this time, varies from week to week in individual cases, but the child should double its birth-weight at six months and treble it at the age of one year. At birth, the average healthy child is between nineteen and twenty inches in length. During the first year there is generally a gain in length of from 6 to 10 inches.

Respiration. The first respiration of the new-born infant is probably caused by the combined influence of at least two conditions affecting the respiratory centre in the medulla oblongata. These two conditions are stimulation of the res-

piratory centre through the nervous system, and through changes in the fetal blood. The change in the fetal blood at birth consists in an excess of carbonic acid gas, due to the cessation of the placental circulation. Carbonic acid gas acts as a stimulant upon the respiratory centre. The first inspiration is followed by expiration, and pulmonary respiration is established. The rate of respiration varies between 40 and 45. The breathing in the infant is almost entirely abdominal, the work being done largely by the diaphragm. The circulatory changes consisting in the obliteration of the ductus arteriosus, the ductus venosus, and the gradual closing of the foramen orale and the establishment of the pulmonary circulation, do not require extended description. The pulse for a few weeks after birth is very feeble and rapid. During sleep in the first week it averages about 120 beats to the minute; while awake, 130; and under excitement or muscular activity, such as crying, 140 to 150. At birth the fetal temperature averages about 99.5° to 100.5° F. Soon after birth the temperature falls about 1.8° , but again reaches the normal infant temperature of 99.4° F. in about twenty-four hours.

Digestive System. The salivary secretion is present at birth, but possesses but feeble digestive power. In the stomach there is present, in relatively larger amount than in the adult, a ferment known as the rennet ferment, the action of which is to curdle milk. Provision for the digestion of starches is lacking in young children. As soon as

milk enters the stomach the rennet ferment forms a soft, flocculent curd. Reaching the intestinal tract the milk is brought into contact with the pancreatic secretion, which completes the digestion of the proteids begun in the stomach and also emulsifies the fats and changes starch into sugar. The bile also helps to emulsify the fats. Absorption takes place mainly in the small intestine, as the glands in the large intestine are as yet imperfectly developed. The feces of the newly-born infant during the first two or three days consist of meconium. Meconium is a thick, tarry, greenish-black substance composed of mucus, bile, epithelial cells, hair, and fat globules. After the fourth or fifth day the stools of a healthy infant are yellowish in color, pasty in consistency, of acid reaction, and not disagreeable in odor. The color is due to bilirubin and the reaction to lactic acid.

Urine. The infant as a rule voids urine immediately after birth. The urine has a specific gravity of 1004 to 1010, is strongly acid in reaction, contains albumin in a large proportion of cases, granular and hyaline casts, an excessive amount of uric acid, and frequently sugar. In a short time after birth the albumin disappears with the casts, epithelium, and excessive mucus, and the specific gravity varies from 1003 to 1006. Normal urine should not stain the diaper.

Liver. At birth the liver is exceedingly large in proportion to the size of the body. Immediately after birth the secretion of bile is lessened because of the diminished blood supply.

Heart. At birth the walls of the two ventricles of the heart are nearly of the same thickness. After birth the increased amount of work thrown upon the left ventricle causes its wall to increase in thickness much more rapidly than that of the right ventricle, so that it becomes about twice as thick. The apex beat of the heart is farther to the left in infants, and the heart sounds are much louder comparatively owing to the thin chest-walls and the greater area of cardiac dulness.

Breasts. At birth or soon after the breasts of the infant are sometimes found swollen and secreting. The secretion is greatest at the end of the first or beginning of the second week. Usually the secretion continues about two weeks, but may be found much later. Males as well as females may have thin secretion from the breasts. A compression bandage is the treatment usually employed, but attempts to express the secretion should be forbidden as an abscess may follow.

Infant, New-born, Diseases of.

Apoplexy of the New-born. When the blood lies upon the surface of the brain or between the meninges, the term meningeal apoplexy is used; when the hemorrhage occurs in the brain substance, cerebral apoplexy is the proper term. The cause of the hemorrhage in the great majority of cases is prolonged pressure. A long labor in which the head is exposed for many hours to constant pressure, or the injudicious use of the forceps, are common causes. Syphilis may be the cause in occasional cases, and pressure produced by the cord

about the neck of the fetus is a possible cause. The hemorrhage may occur in any location. The most common seat is beneath the pia mater.

Symptoms. When due to protracted labor, the infant is born apparently dead, resuscitation is difficult, the cry is feeble, the eyes are motionless, and the extremities are limp. The face is pale, and the respirations are gasping. As a rule respiration can not be fully established, and the child lives but a few hours or a few days. If respiration can be established, paralysis usually follows, and convulsions and rigidity of the entire body are often present. If the child survives, the hemorrhage is gradually absorbed, and the surrounding parts tend to assume their normal functions. Recovery is rarely complete, and many cases of epilepsy and idiocy can be traced to a probable hemorrhage in the brain occurring in the course of a prolonged or instrumental labor.

Asphyxia neonatorum. See *Asphyxia neonatorum*.

Atelectasis. See *Atelectasis*.

Caput Succedaneum. See *Caput Succedaneum*.

Cephalhematoma. See *Cephalhematoma*.

Colic. Colic or enteralgia is a frequent affection of infants. The irritation which causes the pain may be either chemical or mechanical. Indigestion is the cause of colic in the great majority of cases. The bowels may be constipated, but, as a rule, the bowels move more freely than is natural, and the stools are either green and accompanied with mucus, or filled with small masses of undigested

curd. In a few cases colic is a manifestation of an inherited neurotic tendency. In these cases no change in the diet seems to make any difference in the frequency or the severity of the attacks. Infants who have colic usually develop the tendency during the first few days or weeks of life. Such cases continue to suffer at intervals until the age of eight or nine months is reached. If the infant does not have colic during the first month, it usually escapes such attacks, if its food supply is properly regulated.

Symptoms. Attacks of colic begin suddenly. The facial expression is one of misery, and the angles of the mouth are drawn down. The cry of the child is violent and paroxysmal, there is violent alternate flexing and straightening of the lower extremities, the abdomen is tense and hard and more or less tympanitic. In severe cases the skin is cold and clammy, the pulse is feeble, and convulsions may occur. The possibility of intussusception, or appendicitis, must be remembered. Relief is experienced from the expulsion of flatus or by steady pressure.

Treatment. Enemas of hot water, hot fomentations applied to the abdomen, or the hot bath are valuable palliative measures. Turpentine stupes to the abdomen often relieve. To prevent the recurrence of attacks of colic, a careful study must be made of the infant's digestive powers, and its food supply must be properly regulated. In bottle-fed infants, colic is often due to the patient's inability to digest the proteid constituents of the

milk. A diminution in the percentage of proteids frequently results in markedly diminishing the frequency and the severity of the attacks of colic. Chilling of the body surface, or a diet containing cereals in excess, are prominent causes of colic. The remedy is self-evident. The following Homœopathic remedies will prove exceedingly helpful in the treatment of infantile colic:

Belladonna. The child cries out suddenly, and after a while stops crying as suddenly as it began, and appears as if nothing had been the matter. Tenderness to slight pressure, but relieved by hard pressure across the abdomen. Congestion of blood to the head. Starting, with jerking of muscles.

Chamomilla. Child very irritable and fretful, must be carried. Sleepless; starting and jerking while asleep. Hot face, red cheeks, hot sweat.

Colocynth. The child writhes in every possible direction, doubles itself up and seems in great distress. Tympanitic distention of the bowels, > by passage of thin, yellow stools, accompanied by great discharge of wind.

Jalapa. When the child is "good" all day, but screams and is restless all night.

Magnesia phosphorica. Violent cutting pains so that the child screams out, relieved by bending double or by pressure with the hand, and by external warmth. Cramps and wind colic, often accompanied by a watery diarrhea.

Nux vomica. Much colic with constipation. The child cries much, draws its feet up, and then kicks them out again. Colic in nursing babies

whose mothers live on highly-seasoned and stimulating food.

Plumbum. Great pain with obstinate constipation. Abdomen hard as a stone and drawn into the spine as if by a string.

Stannum. The child's colic is relieved by pressing firmly upon the abdomen. When it is crying with colic, relief is at once obtained by carrying it with its abdomen resting upon the point of the nurse's shoulder.

Constipation. Constipation is frequently observed even in the very young. Anatomical peculiarities predispose to constipation in the infant. The intestine is relatively longer than in the adult, and its walls are relatively weaker. The peristaltic movement is slight. Another anatomical peculiarity is the deep cul-de-sac which the sigmoid flexure forms before it joins the rectum. Habitual constipation in the mother is often a predisposing cause of constipation in the infant. Other causes are deficient glandular secretion, excessive perspiration, purgative and laxative medicines, intestinal obstruction, congenital malformations, and chronic peritonitis. Certain diseases of the nervous system are attended by constipation. Meningitis, myelitis, and hydrocephalus have constipation as one of their prominent symptoms.

Treatment. Drugs play but a small part in the treatment of constipation in infants. All purgative and laxative medicines should be discarded. After excluding congenital defects, we should look to the mother for the cause of the constipation.

If the child is bottle-fed, the food supply must be carefully investigated. The proper amount of fat may be lacking, or the proteids may be excessive. A common cause of constipation is the lack of sufficient fluid in the system. Water should be given systematically and in sufficient quantity. When relief is urgently demanded, an enema of warm water is the safest and most effectual measure. One or two fluid ounces is sufficient. Gluten or glycerine suppositories introduced into the rectum at the same hour each day help to establish the habit of a regular movement. The use of oatmeal water as a diluent instead of plain water will prove helpful in bottle-fed children.

As stated above, medicines are not necessary as a rule in the treatment of constipation of infants. However at times the indicated Homœopathic remedy may afford relief, until the changes in the diet and hygienic treatment effect a cure. The following remedies may be consulted:

Alumina. There seems to be a want of action in the rectum; the child has to make a very great effort, even for a soft stool.

Bryonia. The stools are very dry, as if burnt, and of a dark color; dry lips and mouth. Alternation of constipation with diarrhea.

Calcarea carb. Hard, undigested stools of a light color.

Graphites. The stools are very large, and the child has more or less humid eruption over the body, behind the ears, on the face, or in the groins. This eruption exudes a watery, transparent, gelatinous fluid.

Nux vomica. Stools large and difficult, or small, frequent and painful, with much colic. The child is sleepless and restless.

Sulphur. The child has intertrigo, pimply eruptions, swelling of the skin, soreness of the anus, so that it screams with every attempt to evacuate the bowel.

Hemorrhagic Diathesis. A tendency to bleed, at first perhaps from the umbilicus, then from mucous membranes, and finally from the integument is the characteristic symptom of this condition. Such children are known as "bleeders." The exact cause is unknown. Heredity appears to be a prominent factor. The prognosis is usually favorable, although a fatal result is not uncommon. Anæmia naturally results from a continuance of the condition. The treatment consists in the application of astringents to the bleeding surface. Adrenalin solution is probably the best preparation at our disposal. Stimulation may be necessary.

Hemorrhage from the Female Genital Organs. A slight oozing of blood from the vagina during the first few days after birth occurs in a few cases. In some cases this appears to be physiological and analogous to a menstrual discharge. In other cases this discharge of blood from the vagina has been noted in infants dying shortly after birth, especially premature infants. No treatment is required, if the hemorrhage is slight and there are no evidences of the existence of the hemorrhagic diathesis.

Hemorrhage, Gastro-Intestinal (Melena). Hemorrhage from the gastro-intestinal mucous surface is sufficiently common to merit mention. It rarely occurs after the twelfth day. The cause is not definitely known, but changes in the blood or in the blood vessels, or in both, are the probable causes. Deep erosions or ulceration in the gastro-intestinal tract, and constitutional diseases such as syphilis, sepsis, and hemophilia are possible causes. The presence of blood is the first symptom to attract attention, and blood in the stools is more common than hemorrhage from the stomach. The blood from the bowel is usually dark and mixed with meconium, which is apparently more profuse than usual. In twenty-four hours, if the hemorrhage continues, the child shows marked evidences of internal hemorrhage, and becomes pale and cold and weak. The pulse is small and rapid; respiration frequent and sighing; collapse and death soon follow.

The *prognosis* is bad. The mortality is from 50 to 70 per cent.

In the *diagnosis* of this affection it should be remembered that vomiting of blood may result from nursing from a fissured nipple.

Treatment. Every effort should be made to support the strength of the child by proper food and appropriate stimulation. The internal use of astringents is of little value. In severe cases no treatment is of any avail.

Hernia, inguinal and umbilical. See *Hernia in the Infant.*

Icterus Neonatorum. The simple or physiological variety of icterus occurs in 75 per cent. of all infants. The jaundice is slight in degree, affecting usually the face and the trunk only. This form of icterus disappears spontaneously within a week or ten days. No treatment is necessary. The cause of this variety of icterus is supposed to be hepatogenic, the small common biliary duct failing to carry off the excess of bile.

The malignant or symptomatic variety of icterus will be described under *Infectious Diseases of the New-Born*.

Infectious Diseases of the New-Born. Septic infection in the newly born is a systemic disease, which begins usually at the navel, and later involves other parts of the body.

Pathology. The umbilicus is the starting point of the infection in the great majority of cases. Injuries or abrasions of the skin and mucous membranes, and of the conjunctiva furnish other avenues of entrance. When infection has once entered the system, it travels by various channels. It may be carried by the lymphatics into the general circulation, or a purulent phlebitis may develop at the point of infection, and embolism develops similar lesions in other parts of the body. One organ alone is rarely affected. Several or, it may be, all the organs show evidences of disease.

Symptoms. The symptomatology varies as different organs are affected, or as the entire system is involved. The symptoms usually appear in the first week, never later than the twelfth day. The

fever is irregular, the temperature is frequently very high, while some cases show little or no elevation of temperature. There is rapid loss of weight, the pulse is generally rapid and weak, and respiration rapid and shallow. Vomiting and diarrhea are common. The child is restless and irritable. Muscular twitchings, and finally stupor or convulsions are present in the later stages. The abdomen is generally swollen and tender, and by pressure around the umbilicus a few drops of purulent material may be expressed. Other symptoms, such as icterus and gastro-intestinal hemorrhage, may be associated with the septic process.

Treatment. Strict antisepsis is capable of preventing the disease. When infection has occurred the child should be isolated and treated in accordance with the symptoms. External suppurative processes require surgical treatment.

1. *Umbilical Sepsis.* The subject of umbilical sepsis is one of great perplexity. The following classification is perhaps the best: (1) Infection of the cord proper. (2) Infection of the granulation tissue of the wound after detachment of the cord. (3) Infection of the tissues around the umbilicus. This is manifested by erysipelas or lymphangitis. In rare cases, gangrene occurs. Pemphigus around the umbilicus is a cutaneous manifestation of sepsis. (4) Infection of the umbilical vessels—arteritis and phlebitis.

2. *Gastro-intestinal Sepsis.*

Some of the manifestations of this form of sepsis are as follows:

(1) *Ulcerous Stomatitis*. This condition is usually due to infection by the streptococcus.

(2) *Thrush (Sprue)*. This is a local disease of the mucous membrane of the mouth due to the growth of a vegetable parasite. The exact nature of the fungus which causes thrush, has not been fully determined. The disease manifests itself in the formation of white points resembling curdled milk; these white points may remain single or coalesce to form patches of greater or less extent. When these patches are forcibly separated from the mucous membrane, small bleeding points mark the previous sites of the fungus growth. The mouth is very tender, and nursing is difficult.

(3) *Aphthous Stomatitis*. A morbid condition the mouth characterized by the appearance of whitish vesicles, followed by shallow ulcers. The bacterial origin of the disease has not been demonstrated. The disease is more liable to occur after the tenth month than in the newly-born. Several crops of ulcers may follow in succession and interfere with the child's nutrition.

(4) *Gangrenous Stomatitis (Noma)*. A rare, but extremely fatal disease. It occurs in the female genitals, the nose, and the ear, as well as in the mouth. There is extreme prostration, high temperature, rapid pulse, and foul breath. Pain may be absent and is rarely severe. The ordinary duration of the disease is a few days. The *prognosis* is bad.

The *treatment* of these diseases of the mouth in infancy will not be discussed, as it is fully described in the various works upon the diseases of children.

(5) *Parotitis*. Both the parotid and submaxillary glands may become infected by pyogenic germs from the mouth.

(6) *Retro-pharyngeal Abscess*. This affection is believed to be due to infection through the mouth.

(7) *Gastro-enteritis*. Severe gastro-enteritis due to nursing from an infected breast is sometimes observed. The disease begins with vomiting and diarrhœa. If the cause is not discovered, persistent diarrhœa develops, with inanition and systemic infection.

3. *Cutaneous Sepsis*.

(1) *Dermatitis Exfoliativa Neonatorum*. The affection usually begins about the mouth and extends over the entire body. The skin becomes intensely red and desquamates in large flakes. The temperature is subnormal. About one-half the children recover.

(2) *Septic Pemphigus*. Within the first few days after birth bullæ make their appearance upon some portion of the skin and tend to involve the entire surface of the body. The ordinary germs of suppuration can be cultivated from the fluid contents of the bullæ. Numerous evidences of general sepsis may appear. The *prognosis* is unfavorable. Erysipelas and syphilis must be differentiated in the *diagnosis*. The fact that the vesicles of septic pemphigus rarely appear on the palms of the hands and soles of the feet is of considerable value in the diagnosis.

(3) *Ecthyma Neonatorum*. Ecthyma occurs by preference in premature and feeble children. The

lesions resemble those of ecthyma in the adult, but there seems to be a special tendency for the pustule to ulcerate. The pustules occur most frequently on the head, neck and abdomen. Fever, vomiting, diarrhea, etc., may precede or accompany the development of the eruption.

(4) *Multiple Abscesses*. Multiple abscesses in the new-born infant are of two types; the superficial or benign, and the deep or septic. The superficial type represents a local infection, while the septic type is believed to be due to the swallowing of pus from an infected breast.

(5) *Erysipelas*. Erysipelas is usually seen in the first two weeks of life. The specific germ enters the system at the navel, through small fissures at the anus, or abrasions of the skin. If the infection starts at the umbilicus, localized or general peritonitis is likely to follow. Acute degeneration of the liver and kidneys is frequent. The disease begins with vomiting, high fever, and marked prostration. The skin is hot, dry, red, and tender, and the inflammation rapidly spreads over the body. The *prognosis* is bad, especially when the disease starts at the umbilicus.

4. *Tetanus Neonatorum*. Tetanus is an acute infectious disease of infrequent occurrence. The main symptom of the disease is a tonic spasm of the muscles of the jaw extending rapidly to the voluntary muscles. The tetanus germ enters usually at the umbilicus, although abrasions of the skin may furnish an entrance.

Symptoms. Ordinarily the first symptom no-

ticed is the infant's inability to nurse. The mouth cannot be opened, the lips are pressed together. This rigidity spreads to the muscles of the trunk and extremities. The face has a peculiar drawn expression, pulse and respiration are frequent, and prostration is marked. Fever is generally present with high temperature just before death. Convulsions appear with the full development of the disease. The convulsions are at first clonic, later becoming continuous. Opisthotonos is marked. Recovery may occur in mild cases, but the prognosis in most cases is unfavorable.

5. *Buhl's Disease*. In 1860, Buhl described a disease of new-born infants whose chief characteristics were fatty degeneration and hemorrhages in the heart, liver, kidneys, and other viscera. The navel is usually healthy so that ordinary sepsis is not present. The body is cyanotic, and it usually shows icterus and oedema. There is usually a history of asphyxia at birth in the cases which have been reported. Buhl's disease is rare, and has only been observed in hospitals. The *diagnosis* is rarely made during life. The *prognosis* is always fatal.

6. *Winckel's Disease*. Winckel has described a disease occurring in the Dresden lying-in hospital, whose symptoms were cyanosis, icterus, hemoglobinuria, somnolence, and rapid collapse without fever. The most striking feature of the disease is the disintegration of the blood and the escape of the hemoglobin through the kidneys. The urine is pale brown in color, and contains renalepithelium,

granular casts with blood-corpuscles, and some albumin. Clinically the disease attacks healthy infants several days after birth. The onset is very sudden, and the patient seldom lives beyond the second day. Winckel could not discover the exact cause of the disease, but it is believed to be septic in origin. Winckel's disease is practically fatal.

7. *Icterus Symptomaticus*. The icterus which is associated with infectious diseases of the newborn infant is known as the symptomatic form of icterus. It occurs in general sepsis, in syphilis, in Buhl's disease, and in Winckel's disease. In these conditions the discoloration of the body is marked, the sclerotic coat of the eye-ball is deeply tinted, and there is rapid loss of body-weight. Urea and uric acid are increased in the urine.

8. *Syphilis*. Syphilis in early infancy may be hereditary or acquired. The hereditary form has been described under *Diseases of the Fetus*. The acquired form of syphilis may originate from nursing, by which a syphilitic nurse infects the child, or infection may occur through the mother who has acquired syphilis after the birth of the child, or through attendants, especially by kissing. Lastly the poison may originate from the midwife or the physician. It is probable that syphilis is not transmitted through the milk of the mother or that of the wet-nurse. Vaccination is a possible means of introducing syphilis.

Symptoms of Infantile Syphilis. The child may be born prematurely and show traces of the disease at birth. In other cases the characteristic

symptoms of the disease do not appear before four or six weeks. Among the first manifestations of hereditary syphilis is snuffles, or the coryza syphilitica. The discharge from the nose is irritating to the upper lip, which becomes excoriated and fissured. The coryza is followed by an erythematous rash, especially about the anus, the genitals, the thighs and the forehead. The mucous membrane of the larynx may be affected, producing hoarseness. Pemphigus is a characteristic lesion. A little later roseola, the maculo-papular syphilides, vesicles, and pustules may also occur. Mucous patches are sometimes observed. Icterus and cyanosis are frequent symptoms of infantile syphilis. The liver is markedly increased in size, and may be the seat of gummata. The hemorrhagic diathesis is frequently present in syphilitic infants. Tenderness and swelling of the long bones is also highly characteristic.

The *treatment* of infantile syphilis consists chiefly in the use of mercury both internally and externally. For inunction the oleate of mercury or mercurial ointment are excellent preparations. For internal use the biniodide of mercury gives good results. The child should, if possible, be nursed by its mother. In artificially fed children the prognosis is unfavorable.

9. *Tuberculosis*. Acquired tuberculosis in early infancy is very rare. Direct transmission from parent to child is possible. A tuberculous mother should not nurse her child, kissing should be forbidden, and the child should sleep in a separate

room. The possibility of acquiring tuberculosis by the ingestion of milk from tuberculous cows has not been definitely determined, but many authorities believe the danger a real one. Pasteurization of the milk will protect the infant from infection from this source.

10. *Ophthalmia Neonatorum*. See *Ophthalmia Neonatorum*.

11. *La Grippe*. The testimony that very young infants may contract this disease is increasing. The diagnosis is difficult, but when the infection is present in the house, if an infant shortly after birth presents the usual symptoms of fever, and great prostration, associated with an involvement of one of the three systems usually affected by this disease, a diagnosis of influenza can be made with reasonable certainty.

Injuries, Traumatic, of the New-Born.

Injuries of the new-born are the result of anomalies of the pelvis, faulty mechanism of labor, or instrumental delivery. Wounds of the presenting part may also be produced through ignorance or rough handling.

1. *Injuries to the Scalp, Face, Neck, Limbs and Trunk*. Wounds of the scalp and face are frequently produced when instrumental delivery is necessary. These injuries comprise lacerations of the scalp and forehead, contusions of the face, and injuries to the facial nerves. The scalp may be injured by attempts to puncture what is supposed to be the bag of waters. Injuries to the head frequently indicate pelvic deformity in the mother.

Spoon-shaped depressions of the parietal or frontal bones are produced by the prominent promontory of the sacrum. The neck of the fetus sometimes shows the effects of long-continued traction. Transverse striae may be observed at the point where the strain is the greatest. There may also be thromboses of the sterno-cleido-mastoid muscle. A swelling is observed in the upper part of the muscle. This swelling becomes harder as the blood is absorbed and usually disappears in from four to eight weeks. Wry neck may accompany this injury and a partial paralysis of the arm upon the affected side.

Perforations of the groin and perineum may be due to the use of a blunt hook or forceps applied to the breech. There may be rupture of the spleen, liver, or lungs, with fatal hemorrhage, especially in syphilitic infants. The kidneys, spleen, and liver have been ruptured in attempts to extract the breech.

2. *Injuries to the Skull and Other Bones.* Injuries to the cranial bones may be complete or incomplete fractures, or simple depressions. Cranial fractures are usually accompanied by extra-cranial or intra-cranial hemorrhage. Fractures may sometimes be extensive and yet no serious consequences apparently follow. The possibility of remote effects must always be considered. Injuries to the spinal column sometimes occur from prolonged traction on the feet in breech cases. Fractures of the clavicle and humerus are not uncommon during the delivery of the arms in breech presentations.

3. *Injuries to the Brain and the Peripheral Nerves.* Injury to the brain is the result of pressure by the forceps or of the violent extraction of the after coming head. There may be a more or less extensive meningeal hemorrhage, or there may be simply compression of the brain. The facial and brachial plexuses are the peripheral nerves most frequently injured. Facial paralysis is usually due to faulty application of the forceps. Brachial palsies result from faulty manipulation in the extraction of the arm in breech presentations. Facial paralysis as a rule disappears in a few weeks. Brachial paralysis is more stubborn and frequently results in permanent deformity.

Mastitis. See *Infant, New-Born.*

The Navel, Diseases of. Under normal conditions the stump of the cord drops off about the fourth to the sixth day after birth. The cicatrix should look clean, but will remain moist until the tenth or the twelfth day. As the umbilical wound furnishes the entrance to the infection in most cases of sepsis, the importance of antiseptic treatment of the umbilicus is readily understood. The application of a dusting powder composed of one drachm of salicylic acid to one ounce of powdered Venetian talc is of especial value. It will promote the dessication of the cord and will keep the umbilical wound aseptic.

1. *Umbilical Hemorrhage (Omphalorrhagia).* There are two classes of umbilical hemorrhage; hemorrhage from the vessels of the umbilical cord; hemorrhage from the umbilical wound.

Hemorrhage from the umbilical vessels before the cord has separated is usually the result of faulty ligation. Hemorrhage, however, does not always follow imperfect ligation. Many cases are on record where no ligature has been applied, and yet hemorrhage has not occurred. Hemorrhage from the umbilical vessels some days after birth is usually the result of gangrene of the cord.

Hemorrhage from the umbilical wound is fortunately very rare, although apparently more frequent in America than in Europe. The causes of umbilical hemorrhage are somewhat obscure. Syphilis, sepsis, and hemophilia account for the majority of cases. The hemorrhage usually manifests itself about the fifth day, although it may occur as late as the second or third week. It is insidious in character, consisting of a general oozing from the umbilicus. The blood shows little tendency to coagulate. There is often slight icterus, clay-colored stools, and sometimes bloody discharges from the stomach and bowels. In severe cases cyanosis and stupor are present, showing grave constitutional disturbance. Ecchymotic spots appear around the umbilicus and in other parts of the body. Death may speedily follow, or the patient may live for two or three weeks. Death may be preceded by symptoms of collapse, coma, and occasionally convulsions.

Treatment. Usually all attempts at arresting the hemorrhage are futile. The best treatment is the ligation of the navel by the use of hare-lip pins. Two pins are passed through the umbilicus

at right angles, and a figure of eight ligature placed tightly around them. Death often occurs even after the bleeding vessels have been completely ligated.

Umbilical Vegetations. Fungous granulations sometimes appear, if the umbilical wound heals slowly and secretes a sero-purulent fluid. These granulations may attain the size of a pea and usually exude bloody serum, which excoriates the surrounding skin. The fungus itself is not sensitive.

Treatment. Cauterization of the growth with the solid stick of nitrate of silver, and the subsequent use of Salicylic acid and talc, one to eight, is usually effective. In some cases the application of a ligature around the base of the fungus and its removal by the scissors may be necessary.

Sclerema neonatorum. This is a disease characterized by extremely low temperature and induration of the skin and the subcutaneous tissue. Sclerema occurs in cases of premature birth and in poorly-nourished infants. It is not necessarily a disease of the newly-born and hence cannot represent the persistence of a fetal state. It has no relation to any infectious process.

Symptoms. The skin is first red and then has a mottled appearance; these changes first appear in the calves of the legs and extend upward to the thighs, the abdomen, the upper extremities, the face, and the head. The rectal temperature falls from the normal to 86° or even 83° F. Œdema renders the skin pale and hard. Gradually the

whole body becomes cold and rigid, and sensibility is lost. Death occurs without convulsions. The *prognosis* is exceedingly grave, although recoveries have been reported. The *treatment* consists chiefly in the application of artificial heat, massage, and the administration of stimulants. An incubator is helpful in maintaining the temperature.

Infection, Puerperal. The term puerperal infection includes all the morbid conditions of the female genital tract and the systemic affections which result from infection during labor or the puerperium by micro-organisms. The micro-organisms which have been proved to cause puerperal infection are as follows: *Streptococcus pyogenes*, *Staphylococcus*, *Gonococcus*, *Bacillus coli communis*, *Bacillus diphtheriæ*, *Pneumococcus*, *Bacillus ærogenes capsulatus* (Gas bacillus), *Bacillus typhosus*.

There is also a kind of puerperal infection caused by decomposition and putrefaction within the uterus or elsewhere in the genital tract to which the term *sapræmia* is applied. Many cases have been classed as *sapræmic* which were really due to infection with pyogenic organisms, and a diagnosis of *sapræmia* at the present time is untenable unless the lochia have been examined bacteriologically.

Etiology. As a general rule puerperal infection is a direct infection from without, the germs being brought to the woman by the hands, instruments, or any infected material which comes in contact

with her generative organs. The possibility of auto-infection has already been discussed, and, while the authorities are divided upon this question, the overwhelming majority of cases of puerperal infection arise from infective organisms introduced into the genital tract from without.

Pathology. The lesions in puerperal infection may vary from a puerperal ulcer on the vulva or in the vagina to an inflammatory process involving the entire generative tract, and in many cases extending beyond it to the peritoneum, and sometimes resulting in a general pyæmia. We may class the various pathological lesions as follows: 1. Puerperal ulcers. 2. Endometritis. 3. Parametritis. 4. Salpingitis. 5. Peritonitis. 6. Phlebitis. 7. Pyæmia.

Puerperal ulcers occur on the surface of the tears about the vulva and the perineum. When these tears become infected they soon take on a dirty, greenish-yellow appearance, and are covered by a profuse purulent secretion. In some cases these ulcers become covered by a whitish-gray membrane resembling a diphtheritic exudate. Despite their bad appearance these ulcers have a natural tendency to heal. These ulcers may exist on the vulva or perineum without infection of the uterus, but when similar ulcerations exist in the upper part of the vagina or on the cervix uteri, the uterus is usually infected.

Endometritis and Metritis. The most usual lesion in puerperal infection is an endometritis. There are several varieties of puerperal endome-

tritis. Thus we may have a putrid endometritis in which the endometrium becomes converted into a stinking, sloughing surface, made up of necrotic material and decidual remains, and bathed with a bloody, purulent discharge. Again we may have a pyogenic endometritis due to direct infection by the streptococcus pyogenes commonly, but occasionally by the staphylococcus aureus and albus. This form of endometritis may be benign or malignant, depending upon the virulence of the germs. Nature establishes a protective barrier which prevents the penetration of the infectious germs into the deeper tissues in the benign form. In the malignant type the germs are so virulent or exist in such numbers that they penetrate the leucocyte barrier and make their way along the lymphatics to the peritoneal surface of the uterus causing a peritonitis. Endometritis from mixed infection is doubtless more frequent than usually supposed. Whenever a portion of the uterine contents is not evacuated and a putrid endometritis results, infection from pyogenic bacteria readily occurs. The presence of a putrid endometritis lowers the local resisting power of the endometrium, and bacterial infection is easy, and the multiplication of the streptococci is rapid. In the majority of cases endometritis from mixed infection begins with the putrid form.

Puerperal Metritis is practically synonymous with malignant endometritis. The muscular coat of the uterus is invariably affected if the infectious germs pass the leucocyte barrier. In most cases

the streptococci follow the lymphatics, and parametritis or peritonitis develops. In some cases the streptococci invade the finer lymphatics and the vascular walls, causing intra-muscular abscesses, and sometimes leading to necrosis of entire portions of the muscular wall (dissecting metritis). Direct infection of the veins at the placental site is probably the commonest seat of puerperal endometritis. As soon as the veins or thrombi are infected it is no longer a question of metritis, as the infection extends along one or more of the uterine veins, and we have special consecutive lesions. Consecutive lesions may be divided into (1) lesions due to lymphatic extension—parametritis, ovaritis, perimetritis, and general or malignant peritonitis—and (2) lesions due to venous extension, which include the various types of puerperal phlebitis.

Parametritis. This common complication of uterine infection is due to propagation of the streptococci along the lymphatics to the connective tissue surrounding the uterus. The first effect of the invasion of the connective tissue is to cause a marked inflammatory œdema. The diseased portions are then invested by a wall of leucocytes, and, if the infection is mild, the process stops short of abscess formation and the exudate is eventually absorbed. In more severe cases abscesses result, and the pus gravitates into the connective tissue around the rectum and behind the peritoneum. The abscess may penetrate the rectum or vagina, or may point externally at the groin above Poupart's ligament.

Salpingitis. This is a somewhat infrequent consecutive lesion and should be distinguished from a salpingitis, which is secondary to a peritonitis. When salpingitis develops by direct extension from the uterus, there are the usual symptoms of abscess formation, such as a chill, high fever and local tenderness. In some cases there is also a well-marked oöphoritis. The ovary is enlarged and very oedematous. The process may stop here or go on to abscess-formation.

Peritonitis. There are two forms of puerperal peritonitis—the benign or localized form, and the general or malignant peritonitis. In the benign form of peritonitis the inflammation remains circumscribed, because the exudation brings about adhesion of the parietal and visceral layers. The mode of infection in these cases is usually through the lymphatics the poison passing directly into the peritoneal cavity from the uterus. A perimetritis is, therefore, the most usual type of benign peritonitis. An interesting fact in this connection is the propagation of bacteria through the lymph spaces directly to the peritoneum without the development of a high degree of metritis. The exudate in benign peritonitis may be either sero-fibrinous or purulent. *Malignant or general diffuse peritonitis* is believed to be caused by the excessive virulence of the infectious germs. It does not appear that the germs are necessarily of unusual virulence before they reach the peritoneum, but they may find conditions there which favor rapid multiplication. General peritonitis is

usually sudden in its onset and very rapid in its course. It occurs usually in the first few days after labor. There is extreme distention of the abdomen; a rapid, running, wiry pulse; an extremely anxious, pinched expression of the face. The eye balls are sunk deep in their sockets and there are dark rings under them; there is a peculiar grayish color of the skin, and perhaps high fever, agonizing pain, and possibly dulness on percussion. The latter signs may be entirely absent. There may be absolutely no tenderness, nor pain, no dulness, and very little fever. The prognosis of general, diffuse peritonitis is all but hopeless. Fortunately the death of these patients is often exceedingly peaceful.

The consecutive lesions due to infection through the veins include uterine phlebitis and femoral phlebitis, or *phlegmasia alba dolens*. The thrombi at the placental site furnish a fertile soil for pathogenetic germs. When a thrombus becomes infected, it is apt to disintegrate, and fragments may be carried to distant parts of the body. Liquefaction of the thrombus into a puriform fluid may cause a general pyæmia. Organization of the thrombi into connective tissue is to be regarded as nature's safeguard against infection. The symptoms of uterine phlebitis generally appear rather late in the puerperium, perhaps at the end of a week or two. There is a sudden rise of temperature to 103° or 105° F., and the pulse becomes rapid. The fever soon becomes remittent or intermittent, profuse sweats occur at intervals,

and there are evidences of great prostration. The prognosis is grave, especially on account of the ever-present danger of a metastatic pyæmia.

Femoral phlebitis, or *phlegmasia alba dolens* may be due to phlebitis or cellulitis. The *phlebitic* variety is much more common and is due either to direct extension from a uterine phlebitis or to thrombosis. The symptoms usually appear two or three weeks after delivery. Fever is present and perhaps chilly sensations or a distinct chill. The tongue is coated and there are evidences of gastro-intestinal disturbance. There is a feeling of weight and stiffness in the leg, and often severe pain in the calf of the leg. There may be tenderness along the course of the femoral vein, which may be marked by a red line. The leg swells rapidly and soon attains an enormous size. The skin is often so tense that it will not pit on pressure, and the affected veins may be felt as hard cords. In the *cellulitic form*, the symptoms are much the same, but the swelling begins above and spreads downward. In this form abscesses are likely to develop in the femoral region. There is a possibility of the patient's death from gangrene, septicæmia or from exhaustion due to prolonged suppuration.

Pyæmia. Pyæmia due to puerperal infection is a complication of uterine phlebitis. In this form of infection we may find metastatic abscesses in all the internal organs and frequently in the joints, producing a septic arthritis which may destroy all the tissues composing the joint and terminate

in complete ankylosis. In most cases of pyæmia there is very little uterine involvement. Death is due to exhaustion rather than to peritonitis, the usual cause of death in the other forms of infection.

Diagnosis. The diagnosis of puerperal infection is usually not difficult. If a puerperal patient who has been previously well has a chill and a rise of temperature on the third or fourth day after delivery, we may be practically sure that puerperal infection is present, unless we can account for the symptoms by some other perfectly apparent cause. At the present time no such thing as a "milk-fever" is recognized, and we know that the normal puerperium should be absolutely free from fever. Other causes for a rise of temperature in the puerperium have already been discussed. There are two diseases which may confuse the diagnosis unless exact clinical methods are used. These diseases are malaria and typhoid fever. The examination of the blood for the plasmodium in malaria and the Widal reaction in typhoid fever afford exact methods of diagnosis in these diseases. The examination of the lochia for pathogenic bacteria is another highly important diagnostic measure. After the infection has become well established either as endometritis, parametritis, peritonitis, or one of the other forms, the diagnosis is usually easy. As already stated, the most common form of puerperal infection is an endometritis, which is either of the putrid or septic variety. It is of the utmost importance as far as

treatment is concerned to know which form of endometritis exists. The most exact method of gaining this knowledge is to take cultures from the interior of the uterus. These cultures will show putrefactive organisms in the sapræmic or putrid endometritis, and the pyogenic bacteria, especially the streptococcus, in septic endometritis. The digital examination of the interior of the uterus at the time of procuring the lochial secretion for bacteriological examination often affords very important information. In putrid endometritis the surface of the uterus is usually rough and covered with shreds of broken-down tissue. In the septic form of endometritis the interior of the uterus is frequently perfectly smooth. The inspection of the lochial discharge is of considerable value. In putrid endometritis it is frothy and usually very offensive in odor, while in purely septic cases there is little or no change from the normal appearance and odor.

Treatment, Preventive. The preventive treatment of puerperal infection is of the highest importance. Puerperal infection is wound infection, and the tremendous decrease in the number of deaths from this cause since the adoption of aseptic methods in the conduct of labor is too well known to require added comment. Complete disinfection of the hands is extremely difficult, and the number of vaginal examinations should be reduced to the minimum. In a large number of cases labor can be conducted with absolute safety without a single vaginal examination. After the de-

livery of the child there is absolutely no indication for introducing the hand into the vagina unless there is severe hemorrhage or an adherent placenta. If the third stage of labor is properly managed, adherent placenta is of very rare occurrence. Every perineal tear which extends deeper than the mucous membrane should be sutured at the time of delivery. The use of douches as a routine measure is not advised. If douches are indicated they should be administered by the physician himself, unless he is sure that the nurse thoroughly understands aseptic methods.

Curative Treatment. A *puerperal ulcer* about the perineum is best treated by irrigation with electrozone, 1-8, in mild cases, and in severe cases, by the application once or twice daily of carbolic acid, full strength, followed immediately by alcohol. If the perineum has been repaired, and its edges are suppurating, remove the stitches at once so as to obtain free drainage. Puerperal endometritis is the most common form of puerperal infection, and some uniform mode of treating such cases is highly desirable. As soon as the patient's temperature reaches 102° or 102.5° , unless puerperal infection can certainly be excluded, the uterus should be investigated. After careful sterilization of the hand, a certain amount of the lochial secretion should be removed for bacteriological examination, after which the index finger should palpate the interior of the uterus. If the uterine cavity is found perfectly smooth, an intrauterine douche of sterile water or normal salt solution

should be administered. A curettage is not indicated and can only do harm. If the interior of the uterus is found rough and containing more or less débris, the uterus should be thoroughly curetted and douched. Antiseptic douches are not believed to give as good results as do sterile water or normal salt solution. Curettage should never be done but once in these cases, and many authorities advise against its use at all, claiming that the finger is the most efficient and least harmful means of removing débris from the uterine cavity. If the temperature does not fall promptly after the first intrauterine injection, the injection may be repeated one or more times. Other measures advocated by good authorities are the use of the ice-bag and the administration of ergot. The indicated Homœopathic remedy is of great value in the treatment of these cases, but should not be relied upon to the exclusion of treatment directed to the destruction of the germs which cause the diseased condition. There is one remedy which is especially adapted to these cases. I refer to *Echinacea angustifolia*. In the form of Lloyd's specific tincture this remedy has been used with striking success in the treatment of puerperal infection. The curative dose varies from five to ten drops, repeated every hour or two hours according to the severity of the case. I repeat the statement made above, that local treatment is absolutely essential to success in the management of these trying cases. Stimulants and a large amount of nourishment are efficient aids in restoring these patients to

health. The nourishment is usually given in the form of milk. The stimulant commonly used is whiskey, which is usually given in the milk. It is surprising to note the large amounts of whiskey which these patients will take without the slightest evidence of intoxication. Much attention has been paid in recent years to the operative treatment of puerperal infection. The chief discussion has been as to the advisability of removing the infected uterus at an early period. It would appear that in the vast majority of cases hysterectomy in the early stages of puerperal infection is inadvisable. There is, however, a limited field for hysterectomy in certain cases in which the process has not extended materially beyond the uterus, but has caused abscess formation within its walls. To perform laparotomy as a last resort without precise indications is not justifiable, although now and then a cure may be accomplished. The use of Marmorek's antistreptococcus serum has not been satisfactory, although in cases of pure streptococcus infection it deserves a trial. In cases of mixed infection it seems to be of doubtful value. The principle of the treatment is probably correct, and, if a reliable serum can be produced, the results should be more favorable. The subcutaneous injection of large quantities of salt solution is a method of treatment which has been advocated and should receive further attention.

Pryor's Iodine treatment has yielded good results in many cases. Pryor cures the uterus and packs the cavity with iodoform gauze. He

also makes an incision in the posterior vaginal wall and packs the cul-de-sac full of iodoform gauze. The favorable results obtained are attributed to the absorption of large amounts of iodine into the system through the infected lymphatics. While this treatment has been highly successful in the hands of its author, the after-treatment is so technical that it will scarcely be adopted by the profession in general.

The intravenous infusion of formaldehyde was recommended by Dr. Barrows, of New York, in January, 1903. Since the original case reported by Barrows, many physicians have tried the method, but the results do not warrant any marked enthusiasm over this treatment.

Inertia uteri. Uterine inertia is that condition in which the uterine contractions are insufficient to dilate the os in the first stage, or expel the fetus in the second stage.

Primary uterine inertia is that condition of weak pains in which the uterine contractions have been inefficient from the beginning of labor.

Secondary inertia is a gradual or sudden cessation of strong uterine contractions, generally in the second stage. Primary inertia may be due to a defect in the muscle itself, to defective innervation, or to a mechanical interference with the effective action of the muscle. Thus imperfect development of the uterus or abnormal shape of the uterus, as uterus bicornis, may cause inertia. Again, overdilatation of the uterus, as in twin pregnancies or hydramnios, exhaustion from rap-

idly succeeding pregnancies, from some infectious disease, or from profuse hemorrhage as in placenta previa may be efficient causes.

The failure of proper innervation to the uterus has been considered a cause of primary inertia uteri, but this has not been conclusively demonstrated. The effect of an inhibitory nervous impulse to the uterine muscle is a well known cause of uterine inaction. Some strong emotion, or great pain, or the presence of anyone who is disagreeable to the patient often inhibits uterine contractions. In hyperesthetic women the uterine contractions at the beginning of labor may be so extremely painful to the patient that an inhibitory impulse cuts them short. Such women may suffer for hours in the first stage of labor, and yet make no appreciable progress. With the continuance of labor the patient becomes hardened to the suffering, and the inhibitory nerves do not respond to the stimulus of pain. The mechanical causes of primary inertia are fibroid tumors of the uterine walls, displacements of the uterus, and old peritoneal adhesions.

Secondary inertia occurs more frequently than primary and is due in the majority of cases to fatigue of the uterine muscle. It is common in primiparæ on account of the difficulty of dilating the rigid cervical tissues. In a general way, secondary inertia is apt to appear in any case in which there is any condition which offers an obstruction to the normal passage of the child.

Symptoms. One of the first symptoms is the

failure of the pains to cause progressive dilatation of the cervix. Then the contractions become of shorter duration with longer intervals. By palpation we may readily determine that the uterus does not assume the hard consistency which is present during a normal contraction. Examination of a primipara will usually reveal a firm cervical ring and apparent obstacle to the completion of the first stage, provided the pains were efficient. In a multipara a soft, flabby cervical ring will usually be found, with vaginal walls so soft and readily dilatable that it appears that a few strong contractions would expel the child. In either case at this period the pains may practically cease and the patient fall asleep. Efficient contractions may not ensue for twelve or twenty-four hours. If the membranes are unruptured, no serious effects upon mother or child will result. If the membranes have ruptured prematurely the symptoms become more serious. The liquor amnii slowly drains away, and the efforts to open the cervix lead to exhaustion much earlier than in cases with the bag of waters intact. Should the liquor amnii drain away completely, the formation of a contraction ring and dangerous thinning and possible rupture of the lower uterine segment may be the result. The symptoms of inertia uteri in the second stage are not unlike those of the first stage. The uterine contractions are weak and irregular, or tetanoid. This condition may result from the failure of the auxiliary forces to co-operate with the uterus. There may be no bearing-

down. Inertia may depend upon a full bladder or rectum or the presence of some obnoxious individual. A general characteristic of inertia in the second stage is the dry condition of the maternal passages. If inertia uteri is due to some obstruction to the delivery of the child a peculiar condition of the uterus develops. The upper segment of the uterus becomes tetanically contracted, while the lower segment is entirely inactive. It is highly important to distinguish this condition from simple inaction of the uterus. Medicines to stimulate the uterus to increased activity are obviously inadmissible in this tetanoid condition. There is some obstruction which must be discovered and removed. The danger of rupture of the uterus under these conditions must be constantly kept in mind.

Treatment. The treatment varies with the stage of labor and the cause of the inertia. Keep the room cool and exclude visitors. In the first stage of labor, if the membranes are unruptured, no attempt should be made to excite uterine action. Rest and sleep should be secured by means of chloral, 15 grains, repeated in one-half hour, if necessary, or a hypodermic of morphia, $\frac{1}{8}$ to $\frac{1}{4}$ grain. At the same time broth, hot milk or gruel should be given to maintain the patient's strength. After a few hours' rest strong uterine contractions often begin and labor proceeds normally. Various drugs have been advised to stimulate uterine action. These drugs may be used when the membranes have been long ruptured and further delay

seems dangerous. Ergot should never be used in the first stage of labor. Quinine in 10 to 15 grain doses by the mouth, or in 20 to 30 grain doses in the form of rectal suppositories, has been highly recommended. Strychnine by hypodermatic injection, grain $\frac{1}{80}$ to $\frac{1}{20}$, is very often useful. Edgar advises the use of Strychnine for some weeks before delivery in cases of general debility. The dose recommended is $\frac{1}{80}$ grain three times daily, beginning at not less than four or more than eight weeks before the expected confinement. One week before the date of confinement the dose may be increased to $\frac{1}{40}$ grain. Chloral is exceedingly useful in the first stage when the uterine contractions are irregular and exceedingly painful, resulting in no progress. General anesthesia is contraindicated in the first stage of labor, but a few drops of chloroform at the height of the pain often has a beneficial effect in painful and irregular contractions. Other measures which are useful during the first stage are exercise in the form of walking, and the application of hot compresses over the sacrum and the hypogastrium. Should these means fail, a careful examination is necessary to ascertain the cause of the delay. No mechanical obstruction existing, a copious, hot vaginal douche should be given every hour or two. The fingers may be swept around within the os to be sure that no adhesions exist between the membranes and the uterine wall. If these measures are unsuccessful some form of intra-uterine irritation must be employed. The use of a Barnes' bag is

usually attended by a prompt response. Manual dilatation, if done gently, is a rational procedure. In the second stage of labor the treatment of inertia uteri, in the absence of maternal or fetal obstruction, resolves itself usually into the application of forceps. In non-engagement of the head the choice may lie between forceps and version. Friction and compression of the fundus, encouraging and educating the patient to use the voluntary muscles in bearing-down, will frequently bring the head to the vulva, rendering extraction easy.

Injections, Intra-uterine. Intra-uterine injections should be used after delivery, if the fingers or instruments have been introduced into the uterus. Creolin 1 per cent., or Lysol. 2 per cent., are excellent preparations to use. The temperature of the douche should be 110° to 115° F. The ordinary glass tube manufactured for this purpose is attached to a fountain bag and the force of the flow is regulated by raising or lowering the bag. At the end of the injection the fluid remaining in the uterus should be pressed out. Intra-uterine injections are also used in the treatment of puerperal infection. At the present time intra-uterine irrigation for this disease is not used so extensively as formerly. Some authorities condemn the intra-uterine douches entirely, while others advise them in cases of putrid or sapremic endometritis only. Strong antiseptic injections have been replaced by saline solution or sterile water.

Injections, Intra-venous. The intra-venous injection of the normal saline solution is the most

effective means at our command for the treatment of acute anemia due to hemorrhage. The normal saline solution is a solution of sodium chloride of the strength of six-tenths of 1 per cent. in sterilized water. A teaspoonful of salt to one pint of sterilized water makes a sufficiently accurate solution. This must be warmed to a temperature of 100° F. at the time of using. The apparatus necessary comprises a glass funnel, a rubber tube, and a canula. The integument over the median basilic vein is disinfected, and the vein made prominent by tying a pocket-handkerchief or bandage about the arm below the shoulder. An incision one inch in length is made at the side of the vein. The vein is now freed for a distance of half an inch with the handle of the scalpel. A needle threaded with a double silk ligature is passed beneath the vein and the ligature is cut. One of the ligatures is drawn into the lower angle of the wound and securely tied. The second ligature is drawn to the upper angle of the wound and loosely tied. The constricting bandage is now removed. The vein is now picked up with dissecting forceps and an oblique upward slit made with the scissors, taking care not to sever the vein completely. The canula is quickly introduced and tied in by means of the upper ligature. The blood will flow down the canula, and when it is full, the rubber tubing is connected and the saline solution allowed to flow. The speed at which the fluid is injected can be regulated by raising or lowering the funnel. When enough fluid has been injected, as indicated by the

radial pulse, remove the canula, tighten the upper ligature tightly, and completely divide the vein. Close the incision by two or three sutures, and apply a dressing.

Insanity, Puerperal. The term puerperal insanity applies strictly to mental derangement beginning during the puerperium, but under this heading will be included all the types of insanity which occur in pregnancy, labor, or lactation. The statistics of asylums show that in from 8 to 10 per cent. of all insane females the disorder developed in consequence of pregnancy. It is estimated that one woman in four hundred confined becomes insane. The disorder develops most frequently in the puerperium, usually within the first two weeks. The insanity of lactation is next in frequency. The insanity of pregnancy, the least frequent type, usually begins after the fourth month and is more frequent in elderly primiparæ, especially the unmarried.

Etiology. Hereditary predisposition is an important predisposing cause. Other neuroses, such as chorea, epilepsy and hysteria, may predispose to insanity. Nervous instability from any cause renders the pregnant woman more liable to mental derangement. Thus the sense of shame and fear connected with the birth of an illegitimate child appears in some cases to bear a causative relation to insanity. The most important exciting cause during pregnancy is undoubtedly toxemia. One writer remarks that the absorption of the products of intestinal putrefaction is the

cause of many cases of puerperal insanity. Other exciting causes of insanity in the puerperal period have been stated to be sepsis, anæmia, post-partum hemorrhage, eclampsia, great exhaustion and profound emotion. In recent years the conviction has been steadily growing that sepsis bears a highly important relation to puerperal insanity. The clinical evidences of the close relationship between puerperal insanity and septic infection are many in number and are extremely suggestive. The pathological findings in fatal cases serve to substantiate this view. No distinctive pathological changes in the brain have yet been found. In the pelvic organs, however, pathological changes due to infection are almost invariably found. It is the opinion of the best obstetricians that in the near future the dependence of all cases of puerperal insanity upon either toxemia or sepsis will be definitely established.

Symptoms. The forms of insanity presented are mania with or without delirium, melancholia, and dementia, the latter being the final stage of chronic cases. There may be a prodromal condition of ill health, manifested by loss of appetite, indigestion, constipation, and flatulence. The patient's color is usually pale, the pulse is irritable and quick, there is restlessness associated with irritability, tearfulness, and constant complaints in regard to petty annoyances. Sleep is disturbed, and the patient is annoyed by bright lights and noises. She expresses no interest in her child and does not care to see it. She turns against her husband,

whom she may accuse of infidelity. She becomes suspicious, and may say that her food is poisoned and refuse to eat it. As the condition deepens, the excitement increases, and the hallucinations and delusions become constant. There are some cases of slower development in which the first abnormality noticed is a stolid silence, with suppressed excitement which finally bursts forth.

In this form the delusions may have a religious coloring, and the patient may accuse herself of crimes, and declare that she is not fit to live. Such a patient may declare that her baby is not her own, or that it must be destroyed as a sacrifice, and that she must herself kill it. Sometimes these patients kill themselves or attempt self-destruction, assigning as a reason that they are burdens to their husbands and their friends. There is a concealed type of the disease in which the patient may appear to be suffering from a slight depression merely, when some sudden and perhaps successful attempt at suicide reveals to every one the gravity of the masked disorder that has existed for some time. Throughout the puerperal state many women have diseased appetites and impulses. These may never amount to actual insanity and may entirely disappear with the re-establishment of menstruation, yet they frequently lead to disorderly acts. Destruction of property, impulsive propensity to steal, and attempts at suicide are common manifestations of these minor derangements. Indications of malnutrition appear early in the course of puerperal insanity.

Early and obstinate constipation, heavily loaded urine, and other evidences of gastro-enteric disturbances are early symptoms. Pallor is marked, the skin has a glossy, drawn look, and the breath the so-called starvation odor. Some patients very early in the disease sink into a delirious condition with occasional periods of consciousness, but without any rise of temperature. This condition is really a toxemia which varies in intensity with the rapidity of absorption and the virulence of the poison.

Prognosis. About 70 per cent. of these patients recover their reason in from three to six months. Of the remaining 30 per cent. from 2 to 10 per cent. die of septic infection or exhaustion; the rest remain permanently insane.

Treatment. Much care and tact are needed in the treatment of these distressing cases. One of the first duties of the physician is to leave the patient alone with her nurses, and this isolation should be strictly enforced. Where the patient cannot have proper nursing and restraint, removal to an asylum is necessary as soon as the diagnosis has been made with certainty. The patient should not be left alone for a moment. All window-shutters must be properly fastened, and the room stripped of all unnecessary furniture, and especially pictures. Some mechanical restraint is necessary in destructive cases, but instruments of restraint should be avoided as far as possible. The bowels should receive careful attention, and the uterus and vagina should be disinfected if any

symptoms of local infection are present. It may be necessary to use hypnotic drugs to procure sleep and to quiet maniacal excitement. Hyoscin hydrobromate in grain doses of the 3x trituration is often a highly successful remedy. The drug should be repeated every hour until its effect is obtained, and then at longer intervals. Should this not succeed morphine will probably be necessary, though chloral, the bromides, chloralamide or paraldehyde may be tried. Chloral should never be given to debilitated patients in whom the red blood-corpuscles are deficient, and the percentage of hemoglobin is low. Hydrotherapy will often succeed in inducing sleep when drugs fail. The diet should be carefully regulated and should consist at first of milk in various forms. The indicated Homœopathic remedy is invaluable in the treatment. The indications for some of the remedies for this disorder are as follows:

Aconite. Where there is much fear manifested, fear of death, of strangers, of getting up; if caused by fright.

Aurum. Very unhappy; continual thought of suicide; manifest weakness of memory and intellect; great sleeplessness day and night.

Belladonna. Desire to escape or hide herself; paroxysms of rage and fury; sleepless nights; fear of ghosts; sometimes desires other people to kill her, that she may be out of her misery; much moaning.

Hyoscyamus. Intense rage and deep anguish; does not know her relatives; complains of having

been poisoned; desires to be naked; constantly throwing off her bed-covers or clothes; entire loss of modesty; fear of being poisoned.

Kali carb. Great sadness; weeps much, and is afraid she is going to die; great absence of mind; seems at a loss to know how to begin to do what she wishes to do; makes several attempts, but is finally obliged to give it up; cannot express herself; abdomen distended with gas; thirst, restlessness and tossing.

Petroleum. Full of strange delusions; thinks there is another baby in bed with her requiring attention, or that she has a third arm or leg; has sharp pains shooting up from the dorsal spine into the occiput.

Platina. Has a voluptuous crawling about the genital organs; very haughty; looks down very disdainfully upon her attendants; black, tarry discharge from the vagina. Horrifying thoughts.

Pulsatilla. Sad, weeping mood; taciturn; very mild and gentle in all her ways; weeps very easily. When closing her eyes sees pictures and all sorts of strange sights; hears all kinds of operatic airs. Sleepless during early part of night.

Stramonium. Nymphomania with obscene gestures and language. Desires light and company; much worse in darkness and solitude; very loquacious, in a prayerful, imploring language; face often red and bloated. She is fearful and full of strange motions.

Sulphur. Disposition to meditate upon religious subjects with despair of salvation; forgets the

names and words she wants to use; weak, faint spells and cold feet; sleeps very lightly.

Veratrum album. Religious melancholy or nymphomania with desire to embrace everybody, and even inanimate substances; much thirst for very cold water; constantly craving cool and refreshing things.

Zincum. A marked degree of melancholy, with fear of thieves, demons and other frightful figures. It seems to be impossible for her to keep the feet still; they are in almost constant motion.

Insanity of Pregnancy. Insanity rarely begins during pregnancy, but may occur. The most common type is melancholia with a tendency to suicide. It rarely appears until after the third month, and is most common in elderly primiparæ. The causes are pre-existence or predisposition, excessive fright, and prolonged anxiety. In the treatment of the case it is wise to avoid asylum treatment if possible. The interruption of pregnancy should not be considered. After delivery the patient should not be allowed to nurse her child, and the secretion of milk should be suppressed as soon as possible.

Insanity of Lactation. Cases of insanity developing after the puerperal period have received this designation. The etiological factor is usually exhaustion. Mania and delirium are rare in this type of insanity. The patient is usually melancholic, quiet, listless and depressed, with frequent delusions of persecution. In the later stages dementia develops, and the patient can scarcely be

aroused from her listless, almost lethargic condition.

Inversion of the Uterus. Inversion of the uterus may be complete or partial. In complete inversions the uterus is turned inside out and upside down. In partial inversions there is a cup-shaped depression of greater or less depth at the fundus. This complication of labor is exceedingly rare, but occurs more frequently in private than in hospital practice.

Etiology. Paralysis of some portion of the uterine muscle, not necessarily at the placental site, must be present to account for the possibility of inversion. Traction upon the cord may be an efficient cause when this paralysis or paresis of the uterine muscle exists. Too vigorous pressure upon the fundus before the placenta has had time to separate is another possible cause. Sudden delivery when the patient is standing; exertion after delivery, such as straining or coughing, and short cord are other causes.

Symptoms. The usual symptoms are acute pain, hemorrhage and shock. Vesical and rectal tenesmus may be present. The pain is usually severe, comes on abruptly, and is referred to the lower abdomen and pelvis. The amount of hemorrhage depends upon the contraction or relaxation of the inverted uterus. Usually the hemorrhage is severe. The pulse is rapid and weak, the skin is clammy. Nausea and vomiting may occur.

Diagnosis. The diagnosis is usually clear, if the

physician is present when the inversion occurs. The physical signs are the absence of the usual abdominal tumor, the presence of a tumor in the vagina, and the character of the tumor. To make a satisfactory examination the bladder and the rectum should be empty. The differential diagnosis from a uterine polypus is as follows: A uterine polypus is insensible and does not contract upon examination. The pedicle can be traced upward into the uterine cavity, and a sound may be passed by the side of the pedicle. An inverted uterus can always be half reduced; a polypus cannot.

Prognosis. Mortality from 30 to 50 per cent. Death, due to either hemorrhage or shock, may occur soon after the accident. Other causes of death are incarceration of an intestinal loop in the inverted uterus, peritonitis, septic infection, and gangrene. Recovery has taken place after the separation of the uterus by sloughing. The prognosis depends largely upon prompt reduction of the inversion.

Treatment. The accident is usually avoidable by proper management of the third stage of labor. When it has occurred, reposition must be accomplished as speedily as possible. Anesthesia is usually necessary. The methods of taxis usually employed are as follows: The first method consists in grasping the fundus of the uterus in the hollow of the right hand and making pressure upward in the axis of the pelvis. An equal pressure should be exerted laterally with the thumb and finger, the ob-

ject being to return first that portion of the uterus which came down last. Care should be taken to direct the pressure toward one side in order to avoid the sacral promontory. The second method consists in direct upward pressure upon the fundus. The third method consists in alternating pressure with the thumb and fingers near the orifices of the oviducts. After reduction is complete, the hand is kept in the uterus till a contraction occurs. A hot intra-uterine douche of sterilized water is then administered, ergot or ergotole is administered subcutaneously, and the child put to the breast. In some cases it may be necessary to tampon the uterine cavity with iodoform gauze. If the placenta is attached to the inverted uterus, it may be separated before taxis is employed, or, if firmly attached, may be separated after reduction is complete. In cases in which the uterus cannot be replaced without great shock to the patient, especially if several days have elapsed, the operation should be delayed temporarily. In such cases, before taxis is attempted, introduce a rubber bag into the vagina and distend the bag with water. After eight or ten hours remove the bag and try taxis. Extreme measures must be avoided, and, if attempts at reposition are not successful within twenty-four or forty-eight hours, no further attempts should be made for three or four weeks. Should the uterus become infected, early amputation is generally advisable.

Kidney of Pregnancy. In 1886 Von Leyden proclaimed the existence of a specific kidney of

pregnancy. It is well known that the kidneys, in common with the other viscera, become congested and hypertrophied during pregnancy. To distinguish between this physiological congestion and the beginning of a true nephritis is difficult and at times impossible. The rule laid down for differentiation is as follows: When careful microscopic examination of the urine finds only hyaline casts, crystals of various sorts and epithelial *débris*, the existence of a true nephritis can be denied. When, on the other hand, epithelial, granular, or fatty casts are persistently present, the diagnosis of nephritis should be made. The presence or absence of albumin does not affect the diagnosis. The causes of the condition known as the kidney of pregnancy are increased intra-abdominal tension; disturbances in the nutrition of the kidney due to the state of the blood in pregnancy; and mechanical pressure upon the spermatic veins and ureters. The important point to remember is that the kidney of pregnancy undergoes resolution after delivery, although apt to recur in subsequent pregnancies.

Kyphosis, Kyphotic pelvis. See *Deformities, Pelvic*.

Labor, Mechanism of. The mechanism of labor is the manner in which the fetus passes through the parturient canal. In order to understand the mechanism of labor the student must be familiar with the shape and dimensions of the obstetric canal and of the fetus. Definitions of terms frequently used in describing the mechanism of labor are as follows:

Attitude of the Fetus. Attitude or posture designates the relation which the different parts of the fetus bear to each other. In the normal attitude the head is bent upon the sternum; the fore-arms are crossed upon the chest; the thighs and legs are flexed so as to bring the knees near the elbows and the feet near the buttocks; the umbilical cord is usually found in the space between the arms and legs, although it may be wound about the neck or body of the child. Faulty attitude during labor may cause many complications, such as incomplete flexion or presentation of the anterior fontanelle; brow and face presentations; prolapse of arms, legs, and cord.

Presentation. The term presentation is used to designate that portion of the child showing itself most prominently at the pelvic inlet at the beginning of labor, or it is the relation which the long axis of the child bears to the long axis of the uterus.

Classification of Presentations :

- | | | |
|------------------|---|-----------|
| I. Cephalic. | { | Vertex. |
| | | Brow. |
| | | Face. |
| II. Pelvic. | { | Breech. |
| | | Footling. |
| III. Transverse. | { | Shoulder. |
| | | Trunk. |
| | | Hip. |

Position. The term position is used to define the relationship between a certain point on the

presenting part, and certain other points on the pelvis of the mother. The points on the presenting part are the occiput in vertex presentations; the chin in face presentations; the frontal bone in brow presentations; the sacrum in breech presentations; and a scapula in shoulder presentations. The four fixed cardinal points on the mother's pelvis are the two acetabula in front and the two sacro-iliac articulations posteriorly.

Classification of Positions :

VERTEX POSITIONS.

- I. Left occipito-anterior—L. O. A.
- II. Right occipito-anterior—R. O. A.
- III. Right occipito-posterior—R. O. P.
- IV. Left occipito-posterior—L. O. P.

FACE POSITIONS.

- I. Left mento-anterior—L. M. A.
- II. Right mento-anterior—R. M. A.
- III. Right mento-posterior—R. M. P.
- IV. Left mento-posterior—L. M. P.

BROW POSITIONS.

- I. Left fronto-anterior—L. F. A.
- II. Right fronto-anterior—R. F. A.
- III. Right fronto-posterior—R. F. P.
- IV. Left fronto-posterior—L. F. P.

BREECH POSITIONS.

- I. Left sacro-anterior—L. S. A.
- II. Right sacro-anterior—R. S. A.
- III. Right sacro-posterior—R. S. P.
- IV. Left sacro-posterior—L. S. P.

SHOULDER POSITIONS.

- I. Left scapula-anterior—L. Sc. A.
- II. Right scapula-anterior—R. Sc. A.
- III. Right scapula-posterior—R. Sc. P.
- IV. Left scapula-posterior—L. Sc. P.

In all presentations with the exception of the shoulder, the first and third positions are the most common.

From a mechanical standpoint all labors are subject to the same physical laws and follow those laws under normal conditions. There is, therefore, but one mechanism of labor for all presentations. The mechanism of labor in the left occipito-anterior positions may be looked upon as the standard. Six clearly defined stages of mechanism can be demonstrated in all presentations with the exception of shoulder presentations. These stages are (1) moulding; (2) engagement and descent; (3) internal rotation of the presenting part; (4) expulsion of the presenting part; (5) internal rotation of the second portion of the fetal ellipse causing external rotation of the presenting part; (6) expulsion of the second part of the fetal ellipse.

I. *Moulding*. The accommodation of the presenting part to the brim of the pelvis is accomplished in vertex presentations by over-riding of the bones of the vault of the skull. In face presentations the bones of the face change but little, although there is moulding of the frontal, parietal, and occipital bones with swelling and œdema of

the facial tissues. In breech presentations moulding is entirely due to compression of the soft tissues.

II. *Engagement and Descent.* Engagement in vertex presentations, especially in primiparæ, often occurs before labor begins. Delayed engagement and descent are observed in posterior positions of the vertex; in brow presentations, and in face and breech presentations.

III. *Internal Rotation of the Presenting Part.* The explanation of internal rotation must be found mainly in the resistance exerted by the pelvic floor. With good flexion and strong uterine contractions, a firm pelvic floor is the most important factor in the production of internal rotation. The greatest resistance of the pelvic floor is found in the posterior segment. The levator ani muscle with the other muscles and fasciæ comprising the pelvic floor form a scoop-like body which by its resistance and contraction guides whatever comes in contact with it toward the vulval slit, the weakest and least resistant portion of the pelvic floor. Whatever portion of the presenting part first strikes the pelvic floor will be directed forward under the symphysis pubis. There are undoubtedly several factors in the production of internal rotation. Accommodation and adaptation, whereby the long diameter of the presenting part adapts itself to the long diameter of the pelvis; the lessened resistance caused by the urethral and vaginal orifices; the inclination of the pelvis; the shape of the child's head; the in-

clination of the uterus—all these factors play a part in the causation of anterior rotation.

IV. *Expulsion of the Presenting Part.* The manner of expulsion of the head in cephalic presentations depends upon the presentation and position. In occipito-anterior positions the head is expelled by a movement of extension; in permanent occipito-posterior positions by extension over the edge of the perineum; in mento-anterior positions of face presentations, the head is expelled by flexion; in permanent mento-posterior positions, impaction occurs with no expulsion. In breech presentations there is a lateral flexion of the trunk during its expulsion.

V. *Internal rotation of the second portion of the fetal ellipse causing external rotation of the presenting part.* The internal rotation of the trunk in cephalic presentations naturally causes an external rotation of the head. The shoulders enter the pelvic inlet in the oblique diameter opposite to the one in which the head entered. The anterior shoulder as a rule is lower than the posterior and reaches the pelvic floor first. According to the principles enunciated in discussing rotation the anterior shoulder rotates under the pubic arch. Complete rotation of the shoulders, however, is not so constant as complete rotation of the head. Even before the shoulders begin to rotate the head makes a partial movement of external rotation in consequence of the untwisting of the muscles of the neck, which have been subjected to a certain amount of torsion during the rotation of

the head. When the shoulders rotate within the pelvis, there must be a decided rotation of the head. This movement is known as *external rotation* or *restitution*.

In breech cases the head is the second portion of the fetal ellipse and enters the pelvis in the opposite diameter to that in which the breech engaged. If the head continues flexed upon the sternum, the occiput rotates to the pubis and the face into the hollow of the sacrum. The explanation of this rotation is believed to be the greater prominence of the occiput so long as the head is well flexed. This internal rotation of the head does not so constantly cause external rotation of the trunk because of the greater weight and bulk of the trunk.

VI. *Expulsion of the Second Part of the Fetal Ellipse.* This includes the delivery of the trunk in cephalic presentation and of the head in breech cases. The controversy over which shoulder is delivered first seems to depend upon the method of delivery. If the head is not supported in the hand, the anterior shoulder is delivered first in 90 out of 100 cases; while, if the head is supported, the posterior shoulder first emerges. The expulsion of the head in breech cases will be discussed under breech presentations.

Vertex Presentations. A vertex presentation is a presentation in which the occipital region of the fetal head presents at the pelvic inlet. The relative frequency of the four positions is as follows:

L. O. A., 70 per cent.

R. O. A., 10 per cent.

R. O. P., 17 per cent.

L. O. P., 3 per cent.

Mechanism of Labor in Vertex Presentations.

I. Left Occipito-Anterior Position.

1. *Flexion and Moulding of the Head.* The sagittal suture corresponds to the right oblique diameter of the pelvic inlet. With good flexion the diameters of the fetal head opposed to the pelvic diameters are the sub-occipito bregmatic and the bi-parietal. Flexion then is an absolute pre-requisite to the normal advance of the head. The cause of flexion is mainly the articulation of the vertebral column with the head at a point nearer the occipital end of the base of the fetal skull. Hence the occipital extremity is more easily depressed by the force of uterine contractions, while the chin and the forehead meeting with greater resistance at the brim of the pelvis are retarded in their descent. Other causes of flexion are the normal attitude of the fetus during pregnancy and the principle of adaptation or accommodation. The moulding of the head in vertex presentations is brought about by certain movements of the bones of the cranial vault upon one another. The greatest reduction in the diameters occurs in the transverse measurements. These diameters are often diminished from three-fifths to four-fifths of an inch. The anterior parietal bone overlaps not only the opposite parietal but also the frontal and occipital bones. The half of the frontal bone which is posterior is overlapped by the neighboring bones and slightly flattened by the promontory of the

sacrum. The portion of the head which is lowest in the pelvis is often forced out into a point and forms the apex of a cone. This explains the location of the caput succedaneum and of a cephal-hæmatoma. Deformity from moulding ordinarily disappears in one or two days after delivery.

2. *Engagement and Descent of the Head.* While engagement and descent are classed as a separate stage in the mechanism, it must be remembered that flexion and moulding and descent proceed simultaneously and are mutually inter-dependent. In primiparæ these two stages of the mechanism may be completed before labor actually begins.

3. *Anterior Rotation of the Occiput.* Descent continues until the occiput reaches the pelvic floor. Rotation of the occiput then occurs so that the occiput comes under the pubic arch, and the sagittal suture occupies very nearly the antero-posterior diameter of the bony pelvic outlet.

4. *Extension and Expulsion of the Head.* The parietal bosses now lie in contact with the tuberosities of the ischium. The bi-temporal diameter corresponds with the narrow transverse diameter of the pelvis between the iliac spines. The occiput is driven down by the force of uterine contractions below the symphysis pubis, until the back of the child's neck rests against the posterior surface of the symphysis. Further progress of the occiput is impossible. The force of uterine contraction is now expended upon the chin, and the head is born by extension.

5. *Rotation of the Trunk and Restitution of the*

Head. The internal rotation of the shoulders causes the head to rotate in such a manner that the occiput points toward the mother's left thigh. This external rotation of the head is termed restitution.

6. *Expulsion of the Trunk.* After the shoulders have rotated, the anterior shoulder becomes fixed under the pubic arch, and the posterior shoulder with the arm and forearm is propelled over the perineum. The delivery of the anterior shoulder quickly follows. The delivery of the remainder of the trunk immediately follows without any special mechanism.

II. *Right Occipito-anterior Position.*

1. *Flexion and Moulding of the Head.*

2. *Engagement and Descent.* The sagittal suture lies in the left oblique diameter of the pelvic inlet.

3. *Anterior Rotation of the Occiput.* This rotation occurs from right to left along the right anterior inclined plane.

4. *Extension and Expulsion of the Head.*

5. *Rotation of the Trunk and Restitution of the Head.* The occiput points to the mother's right thigh when restitution is complete.

6. *Expulsion of the Trunk.*

III. *Right Occipito-posterior Position.*

1. *Flexion and Moulding of the Head.* Flexion is apt to be imperfect.

2. *Engagement and Descent.* Descent occurs in most cases until the pelvic floor is reached. In some cases anterior rotation occurs before the head reaches the pelvic floor.

3. *Rotation of the Occiput.* When the vertex has reached the pelvic floor the case may terminate in one of four ways. *First*, complete anterior rotation of the occiput along the right half of the pelvis to the symphysis pubis. This is the termination of the great majority of cases. *Second*, posterior rotation of the occiput into the hollow of the sacrum, and birth of the head by extension over the perineum. *Third*, posterior rotation and impaction. *Fourth*, the conversion of the vertex presentation into a face presentation. This is an extremely rare termination. The usual termination, *anterior rotation of the occiput*, depends upon causes already explained and needs no further description. *Rotation of the occiput into the hollow of the sacrum* occurs more often than was formerly believed. The causes of this posterior rotation are a roomy pelvis and small child, or a lack of resistance on the part of the pelvic floor. Incomplete flexion which allows the forehead to descend as low or lower than the occiput is another cause. It is possible for the occiput to be born by natural labor under these circumstances, but labor is always extremely protracted. For the head to be born in a persistent occipito-posterior position means that the head and neck must traverse the ten inches of the posterior pelvic and perineal walls.

Posterior Rotation and Impaction is a rare but extremely unfortunate termination. The occiput passes into the hollow of the sacrum, but is unable to reach the edge of the perineum. The body of

the child is crowded down into the pelvic cavity and impaction results. The inevitable termination of such a case is an extensive perineal tear, if the child is delivered, or uterine inertia and exhaustion, if the labor is allowed to continue.

Conversion into a Face Presentation is possible if the occiput becomes arrested in some manner, and complete extension takes the place of flexion. This is an extremely rare spontaneous termination, but such a conversion has been done manually, converting the occipito-posterior position of the vertex into a mento-anterior position of the face.

4. *Expulsion of the Head.* The mechanism of this stage is the same as in the R. O. A. position, if anterior rotation of the occiput occurs.

5. *Rotation of the Trunk and Restitution of the Head.* The internal rotation of the shoulders causes external rotation of the head so that the occiput points toward the mother's right thigh.

6. *Expulsion of the Trunk.* The same mechanism as in R. O. A. positions.

IV. *Left Occipito-posterior Position.*

1. *Flexion and Moulding.*

2. *Engagement and Descent.*

3. *Rotation of the Occiput.* Anterior rotation along the left side of the pelvis in the majority of cases. Posterior rotation into the hollow of the sacrum in a small minority.

4. *Expulsion of the Head.*

5. *Rotation of the Trunk.*

6. *Expulsion of the Trunk.*

Diagnosis of Vertex Presentations. The diagnosis of a vertex presentation during pregnancy is made by abdominal palpation. During labor abdominal palpation may be practiced between pains, but more reliance is placed upon the vaginal examination. The diagnosis of a vertex presentation is made by the characteristic feel of the hard, globular head. Additional certainty is gained by the detection of the sutures and fontanelles. The location of the fontanelles and sutures also determines the position. It is well to remember that the posterior fontanelle becomes obliterated as soon as the head begins to mould, and that it is represented only by the angle between the posterior borders of the parietal bones and the anterior edge of the occiput. Any large, soft opening which can be reached by the examining finger must be the anterior fontanelle. The student should not be satisfied until he distinctly recognizes both fontanelles and the sagittal suture. It is, however, not necessary to make an exact diagnosis in every apparently normal case before rupture of the membranes. When the diagnosis of the exact position becomes necessary, palpation of the anterior ear is a valuable diagnostic sign.

Prognosis. The prognosis in vertex presentations is the most favorable for mother and child. Anterior positions offer the more favorable prognosis. Posterior positions increase the mortality among children and the labors are longer and more difficult.

Face Presentations. A face presentation is a cephalic presentation in which the head is in extreme extension, with the occiput in contact with the neck.

Etiology. The causes of face presentations include: (1) Excessive lateral obliquity of the uterus. (2) Any condition which interferes with normal flexion of the head. Under this heading would come any projection between the chin and the sternum which is a mechanical interference with flexion, such as congenital goitre, coiling of the cord around the neck, hydrothorax. Also any projection or deformity which mechanically prevents descent of the occiput, such as ovarian, fibroid, or other tumors; deformity of the pelvis; a very large or long fetal head. (3) Causes of malposition in general, such as prematurity, hydramnios, twin pregnancies, monstrosities, etc.

Position and Relative Frequency.

- I. Left mento-anterior.
- II. Right mento-anterior.
- III. Right mento-posterior.
- IV. Left mento-posterior.

The right mento-posterior is the most common position with the left mento-anterior nearly as frequent. The other two positions are rarely seen.

Mechanism.

I. *Left Mento-anterior Position.* In face presentations the chin takes the place of the occiput in vertex presentations. The mechanism, however, in face presentations is not so perfect as in vertex presentations for several reasons. In the first

place the direction of uterine contraction is not in direct line with the lowest portion of the presenting part. In the second place anterior rotation of the chin does not occur so readily as the rotation of the occiput, because the chin cannot descend to the floor of the pelvis without stretching the neck. When the chin does finally reach the pelvic floor, its outline is such that it is not acted upon so positively by the factors which produce anterior rotation. The regular stages in the mechanism are as follows:

1. *Extension and Moulding of the Head.* Moulding occurs to a limited extent only, owing to the nearly complete ossification of the bones of the face and the small size of the sutures. The shape of the head after moulding presents a flattened vault, while the frontal bones are increased in their convexity. The diameter of the face which engages in the right oblique diameter of the pelvic inlet is the cervico-bregmatic.

2. *Engagement and Descent of the Face.* The chin descends into the pelvis and by extension of the fetal neck ultimately reaches the pelvic floor. This extension of the fetal neck sometimes amounts to two inches.

3. *Anterior Rotation of the Chin.* The force of propulsion must be sufficiently strong to press the chin down to the lowest point in the pelvis. When this occurs, the chin rotates anteriorly under the symphysis pubis, while the anterior fontanelle sinks into the hollow of the sacrum.

4. *Flexion and Expulsion of the Head.* When

anterior rotation is complete the chin becomes fixed behind the symphysis, and the force of uterine contractions expels the head by flexion, the mouth, the nose, the eyes, and the forehead appearing successively at the edge of the perineum. The chin now sweeps upward, and the bregma, the small fontanelle and finally the occiput emerge from the vulva.

5. *Rotation of the Trunk and Restitution of the Head.* The anterior shoulder rotates to the symphysis, causing the chin to turn toward the mother's left thigh.

6. *Expulsion of the Trunk.* This is the same as in vertex presentations.

II. *Right Mento-anterior Position.*

1. Extension and moulding of the head.
2. Engagement and descent.
3. Rotation of the chin from right to left.
4. Flexion and expulsion of the head.
5. Rotation of trunk and restitution of the head. The chin points toward mother's right thigh.
6. Expulsion of the trunk.

III. *Right Mento-posterior Position.*

1. Extension and moulding.
2. Engagement and descent.
3. Anterior rotation of the chin from right to left along the right half of the pelvis to the symphysis is the normal mechanism. If anterior rotation fails, a persistent mento-posterior position results.
4. Rotation of the trunk and restitution.

6. Expulsion of the trunk.

IV. *Left Mento-posterior Position.*

1. Extension and moulding.

2. Engagement and descent.

3. Anterior rotation of the chin from left to right.

4. Flexion and expulsion of the head.

5. Rotation of the trunk and restitution.

6. Expulsion of the trunk.

Diagnosis. By abdominal palpation the occiput is located, while the fetal heart, the limbs and the small parts are recognized on the opposite side. On vaginal examination the pointed chin, the mouth with its maxillary processes and the tongue, the nose, the eyes, and the supraorbital ridges should be recognized. The face may be mistaken for a breech. The location of the chin determines the position.

Prognosis. The prognosis in face presentations varies greatly with the position. Anterior positions of the chin especially in multiparæ are not unfavorable to either mother or child. Posterior positions of the chin are much more dangerous to both mother and child. The maternal mortality is placed at 6 per cent.; the fetal at 15 per cent. The prognosis for the child in posterior positions is always poor unless the diagnosis is made early in labor and the presentation converted into a vertex. The child is exposed to marked compression of the cranium against the symphysis and to the danger of asphyxia from pressure upon the vessels of the neck.

Brow Presentations. A brow presentation is a vertex presentation in which partial extension has occurred. It is, therefore, an intermediate position between a vertex and a face presentation. Brow presentations occur about once in 1,500 labors. The causes of brow presentation are the same as those for face presentations. The four positions of the brow are:

- I. Left fronto-anterior.
- II. Right fronto-anterior.
- III. Right fronto-posterior.
- IV. Left fronto-posterior.

The first and the third positions are the most frequent.

As a rule, brow presentations are converted either into a vertex or a face presentation as labor progresses. Exceptionally, with a roomy pelvis and a small fetus, the child may be pushed through the pelvis without any special mechanism. In rare cases a special mechanism of a brow presentation may be recognized. This mechanism may be described for a right fronto-posterior position.

1. *Moulding.* This process is extremely slow. The occipito-mental diameter is decreased with a corresponding increase in the occipito-frontal.

2. *Engagement and Descent.* The forehead sinks into the pelvis more deeply than any other part of the head and eventually reaches the pelvic floor if the uterine contractions are sufficiently strong.

3. *Anterior Rotation of the Forehead.* If the forehead reaches the pelvic floor anterior rotation

occurs for the same reasons that account for the anterior rotation of the occiput in vertex presentations.

4. *Expulsion of the Head.* When the forehead comes under the symphysis the flexion of the head is increased. The perineum retracts. The cranial vault first sweeps over the perineum followed by the eyes, nose, mouth and chin.

5. *Rotation of the Trunk and Restitution of the Head.* This movement is the same as in vertex presentations.

6. *Expulsion of the Trunk.*

Diagnosis. The diagnosis of brow presentation is made by vaginal examination. The small fontanelle and the orbital ridges are felt at opposite points, and the large fontanelle in the centre.

Prognosis. Uncertain for the mother and bad for the child. Spontaneous delivery cannot be expected in a brow presentation, and the prognosis depends upon the operation which is chosen for the delivery of the child.

Pelvic Presentations. Pelvic presentations may be divided into breech, knee, and footling presentations. Practically, however, no distinction need be made. A pelvic presentation is a presentation of the breech or the lower pole of the fetal ovoid. Pelvic presentations occur about once in thirty labors, if miscarriages and premature labors are included. At full term the percentage of pelvic presentations is about one in sixty.

Etiology. The causes of pelvic presentations cannot always be determined. In general, it may

be stated that anything which interferes with the normal shape of the fetal ovoid or the normal shape of the uterine cavity after the thirty-second week may result in a pelvic presentation. Among such conditions may be mentioned relaxation of the uterine and abdominal walls, distention of the uterus as in hydramnios, deformity of the uterus, contracted pelvis and placenta previa. On the part of the fetus, prematurity, multiple pregnancy, monstrosities, dead and macerated fetuses.

Positions.

- I. Left sacro-anterior.
- II. Right sacro-anterior.
- III. Right sacro-posterior.
- IV. Left sacro-posterior.

The left sacro-anterior is the most frequent position and the right sacro-posterior the next.

Mechanism.

1. *Moulding of the Breech.* In addition to moulding, the intra-uterine pressure causes more perfect flexion of the limbs and head. The breech is usually swollen over the anterior hip, but no typical caput succedaneum forms.

2. *Engagement and Descent.* The breech is such a poor dilator owing to its irregular shape and small size that this stage is usually slow. The anterior hip first enters the pelvic inlet and is slowly pushed downward until it reaches the pelvic floor.

3. *Anterior Rotation of the Hip.* In accordance with the principle of rotation already discussed the anterior hip rotates forward under the symphysis pubis, thus bringing the long diameter of

the breech, the bi-trochanteric, into the long diameter of the outlet, the antero-posterior.

4. *Expulsion of the Breech and Lateral Flexion of the Trunk.* When the anterior hip has reached the symphysis the force of uterine contractions is transferred to the opposite pole of the presenting part, and the posterior hip is propelled downward along the floor of the pelvis. This movement results in a lateral curvature of the fetal trunk. The anterior buttock now appears at the vulva and becomes fixed under the pubic arch. The posterior hip now swings forward until the posterior buttock and trochanter emerge over the perineum. The perineum retracts and the fetal trunk, released from pressure posteriorly, straightens out, freeing the anterior hip; the whole trunk then moves downward through the pelvis, the hips, the legs and the trunk appearing in quick succession, and the child is delivered up to its waist. As the umbilicus appears at the vulva the shoulders enter the pelvic brim. The bis-acromial diameter of the shoulders engages in the left oblique diameter of the brim. The shoulders descend until the anterior shoulder reaches the pelvic floor. Rotation of the anterior shoulder under the pelvic arch is the next step. If the arms remain in the normal position, flexed on the chest, the posterior shoulder and elbow are forced out over the perineum, and the anterior shoulder, thus released, soon follows.

5. *Rotation of the Head and Restitution of the Trunk.* The pressure of the uterus upon the longer arm of the cephalic lever preserves the flexion of

the head. The head approaches the pelvic inlet in the transverse diameter, but the greater resistance encountered by the occiput causes anterior rotation of the occiput in the great majority of cases. At the same time there is a partial restitution of the trunk, bringing the back of the child to the front.

6. *Expulsion of the Head.* The occiput is caught and held by the pubic arch, while the opposite pole, the forehead, is driven by the force of uterine contraction along the posterior pelvic wall to the vulva. The head is born by flexion, the chin, mouth, nose, eyes, forehead, anterior fontanelle, and lastly the occiput passing over the perineum.

Posterior Rotation of the Occiput. This complication arises from incomplete flexion of the head. Two terminations of this condition are possible: (1) The forehead comes under the pubic arch and the head is born by flexion. (2) Extension of the head occurs at the pelvic brim and the force of uterine contraction brings the chin over the symphysis. The force of uterine contraction is now effective only upon the occipital pole of the head. The occiput therefore is forced down to the vulva and the head is born by continued extension.

II. *Right Sacro-anterior Position.*

1. Moulding of the breech.
2. Engagement and descent.
3. Anterior rotation of the hip.
4. Expulsion of the breech and lateral flexion of the body.
5. Rotation of the head and restitution of the trunk.

6. Expulsion of the head.

The mechanism of the two posterior positions is precisely similar to the anterior positions with the exception that the occiput must rotate all the way round to the symphysis.

Diagnosis. By abdominal palpation the hard, globular head may be recognized at the fundus. The absence of the head at the pelvic brim confirms its presence at the fundus. The fetal heart-sounds are heard a little above the level of the umbilicus. By internal examination at the beginning of labor, difficulty in reaching the presenting part points to a breech presentation. The bag of waters projects deeply into the vagina, sometimes forming an elongated tumor. When the presenting part is within reach of the examining finger, a soft, smooth, somewhat conical surface is encountered. If we assume this to be the head we fail to recognize either sutures or fontanelles. If we assume it to be a breech presentation, we may recognize the anus, the tip of the coccyx, and the spinous processes of the sacrum. As labor progresses the genital may be recognized, the scrotum in boys sometimes enormously swollen, resembling a polypus or tumor. The direction of the tip of the coccyx will determine the position, as it always points away from the back of the fetus.

Prognosis. The prognosis for the mother is favorable, although there is greater likelihood of perineal rupture from the frequency of rapid extractions of the fetal head. For the child breech presentations are dangerous, the mortality rang-

ing between 15 and 20 per cent. The chief danger to the child is asphyxia, due to pressure upon the cord or to partial separation of the placenta. The danger to the child is greater in footling cases, as the feet do not dilate the cervix sufficiently to allow the easy passage of the after-coming head. In difficult cases the child is liable to injury from manipulation during delivery. Fractures and dislocations often occur. Hematoma into the sternomastoid muscle and torticollis have been recorded.

Transverse Presentations. Presentations of any portion of the trunk are included under transverse presentations. Practically all transverse presentations become shoulder presentations under the influence of uterine contractions. The long axis of the trunk is never exactly at right angles with the long axis of the uterus during labor, but there is an angle between the fetal and uterine long axes. The shoulder thus becomes the presenting part.

Frequency. The frequency of transverse presentations varies from 1 in 150 to 1 in 300.

Etiology. In primiparæ the cause of transverse presentations is usually a contracted pelvis. Contributory factors are hydramnios, multiple pregnancy, monstrosities, and malformations of the uterus. In multiparæ relaxation of the abdominal walls is a common cause of transverse presentations. Prematurity of the fetus is another cause, as is hydrocephalus. Tumors of the uterus or pelvis and placenta previa may be mentioned as possible causes.

Positions.

- I. Left scapula-anterior.
- II. Right scapula-anterior.
- III. Right scapula-posterior.
- IV. Left scapula-posterior.

The terms right and left refer simply to the right and left side of the pelvis.

Mechanism. There is practically no mechanism in a transverse presentation, as delivery in the great majority of cases is impossible. Still under certain conditions a transverse presentation has been known to terminate spontaneously in two ways: (1) spontaneous version; (2) spontaneous evolution. Spontaneous version is a change by which nature alters the transverse presentation into a head or breech presentation. The requirements for spontaneous version are a rigid fetus, living and strong; irregular and strong uterine contractions affecting chiefly the fundus. Spontaneous version is most apt to occur in multiparæ with lax uterine walls. After the bag of waters has ruptured, spontaneous version is seldom encountered, although it may occur shortly after the partial escape of the amniotic fluid. Spontaneous evolution has a special mechanism which deserves consideration on account of the fact that success in the delivery of an impacted shoulder depends upon an understanding of the mechanism of the first stages of spontaneous evolution. Certain conditions are necessary for the delivery of a transverse presentation by spontaneous evolution. The pains must be strong, the pelvis roomy, and

the child small. The presenting shoulder is forced downward to the pelvic floor and rotates forward under the pubic arch, the corresponding arm usually hanging outside the vulva. Lateral flexion now occurs so that the head is situated above the brim, lying alongside the breech, the latter being posterior. Under the influence of strong pains the chest is driven down past the shoulder. If the child is sufficiently flexible, and the pains are powerful, the abdomen and finally the pelvis of the child are pushed by the shoulder and appear at the vulva, the presenting shoulder remaining fixed under the pubic arch. With the birth of the breech there remains only the delivery of the after-coming head as in a breech presentation. A rare variety of spontaneous evolution is birth with doubled body. This is seen only with a premature fetus, which is usually dead and macerated. The head and shoulder enter the pelvis together. The arm corresponding to the presenting shoulder protrudes from the vulva. The presenting shoulder is delivered first, followed by the head and chest together, and, finally, the breech and legs.

Diagnosis. Abdominal examination should be sufficient to make the diagnosis. The transverse diameter of the uterus is longer than the vertical, and the outline of the uterus is not symmetrical. As a rule, the fetal back lies anterior. Palpation should detect the round, hard head in one iliac fossa and the soft, irregular breech in the opposite side of the mother's abdomen high up. The resist-

ing plane of the back follows a curved line between the breech and the head. On vaginal examination the cervix is high up in the pelvis, and the bag of waters of irregular shape. When the presenting part comes down within reach, the finger may be able to recognize the axilla, the clavicle, and the spine of the scapula. If any doubt exist, anesthetize the patient and pass the whole hand into the vagina, taking every precaution to avoid rupturing the membranes.

Prognosis. Always serious. If the case is seen early, and the proper treatment instituted, the prognosis for the mother is not bad. Neglected cases give a high mortality for both patients. In such cases the liquor amnii almost completely escapes. Contraction and retraction of the uterus ensues, followed by a tetanic or inert condition of the uterus with or without rupture, exhaustion, and death of both mother and child. The prognosis in general depends upon the prognosis of the operation undertaken, and becomes worse in proportion to the length of time during which the case is allowed to go on untreated.

Labor, Normal. Labor is the act of delivery or child birth. The term normal labor is applied to labors that are terminated by natural forces, or it may be restricted to vertex presentations in anterior positions.

Etiology of Labor. The causes of the onset of labor have not been definitely determined. The theoretical causes are as follows:

1. Excess of Carbonic acid and lessened oxygen

in the placental blood. The motor centre for the uterus in the medulla is supposed to be affected by these blood conditions.

2. Changes in the decidua—loosening, thinning, and thrombosis.

3. Increasing irritability with stronger and stronger intermittent contractions.

4. Increasing tension on fully developed muscular walls.

5. Menstrual periodicity (tenth period).

It is probable that the predisposing causes are many, and that the real exciting cause is some slight circulatory or nervous disturbance brought on by over-exertion, or mental excitement.

The Expelling Forces in Labor. The expelling forces consist of the involuntary forces, or uterine contractions with the contractions of the uterine ligaments, and the voluntary or auxiliary forces which include the contractions of the abdominal muscles, the muscles of the pelvic floor and the vagina. *The uterine contractions* are involuntary, peristaltic, and intermittent. Although these contractions are involuntary, they may be considerably influenced by mental emotions. The uterine contractions are assumed to be peristaltic in nature, probably passing from the Fallopian tubes down to the cervix. The contractions are intermittent; each contraction begins, reaches its acme, and then subsides. The average duration of a uterine contraction, or pain, is about a minute. The interval between contractions is about thirty minutes at the beginning of labor, and from

two to three minutes at the end of labor. The normal intermittent character of the contractions is of the utmost importance to the welfare of both mother and child. If the contractions were continuous the child would die by asphyxiation, and the mother could not endure the intense suffering without periods of rest. Rupture of the uterus would almost inevitably result if there were no intervals of repose. During a contraction the uterus changes its form and position. Its shape becomes more cylindrical, the longitudinal diameter is increased, while the transverse diameter is distinctly decreased. The force of the contractions increases as labor advances. The character of the contraction varies with the presentation. The contractions are more regular and efficient in vertex presentations. In face, brow, breech, and transverse presentations the pains are irregular in character, due to the absence of uniform pressure on the lower uterine segment. The contractions are painful and are termed "labor pains." The cause of the suffering is the pressure of the uterus on the nerve plexuses in the pelvis, the tension of the external os and lower uterine segment, the stretching of the uterine ligaments, and the pressure of the fetus upon the nerves of the vagina. The character of the pain differs with the stage of labor. In the first stage the pains are sharp and colicky in nature, and are felt usually in the lumbosacral region. In the second stage the pains become "bearing down" in quality and are felt in the abdomen as well as in the back. The suffering

from the pains depends upon the nervous constitution of the patient. The pains are generally more severe in primiparæ, especially during the stretching of the vagina and vulva. The pulse-rate is increased during a uterine contraction, and the arterial tension is increased.

The Voluntary or Auxiliary Forces are important factors in expulsion. The abdominal muscles and the diaphragm in contracting increase the general intra-abdominal pressure, and powerfully re-inforce the uterine contractions. The action of these muscles is as follows: The patient takes a deep inspiration, thus depressing the diaphragm. The glottis is now closed and the abdominal muscles contract. Finally the patient is obliged to cry out, thus relaxing the abdominal pressure. It is entirely possible for delivery to occur without the aid of the abdominal muscles. This action of the abdominal muscles is, nevertheless, of great assistance in labor, and is especially valuable in breech cases and in the expulsion of the placenta after it has left the uterus. The vagina has some action in aiding the expulsion of the after-coming head and of the placenta. The pelvic muscles which aid in expulsion are the levator ani, the transversi perinei, and the sphincters of the vagina and of the anus.

The Stages of Labor. The first stage, or the *dilatation* stage, extends from the onset of true labor pains to the complete dilatation of the os. The second stage, or the *expulsion* stage, extends from the complete dilatation of the os to the com-

plete expulsion of the fetus. The *third* stage, or the *placental* stage, extends from complete expulsion of the fetus to complete expulsion of the placenta and membranes. In addition to the three stages of actual labor there is a preparatory stage extending from the sinking or lightening of the uterus until true labor begins. From ten to fourteen days before labor the uterus sinks lower in the pelvis, the fundus falls forward, and the head either engages or sinks down to the pelvic floor. Great relief is experienced by the woman. She breathes more easily, digests her food better, and her clothing is looser. On the other hand, the increased intra-pelvic pressure causes frequent urination, and increased venous obstruction in the legs and in the labia, and greater difficulty in walking. These symptoms are accompanied by increased secretion from the glands of the vagina and the vulva. An internal examination at this time would disclose a shortening of the cervix and beginning dilatation of the internal os. Another symptom of this preparatory stage, especially in multiparæ, is the occurrence of *false* pains. These pains are distinguished from true labor pains by their temporary character, their irregularity, and their failure to increase in frequency and severity. They do not cause any hardening or dilatation of the os. The *first* or *dilatation* stage of labor varies in duration from two hours to several days. The average duration in primiparæ is stated to be sixteen hours; in multiparæ, nine hours. The onset of regularly

recurring uterine pains marks the beginning of this stage. Occurring at first about every half hour with slight discomfort only, the contractions gradually become more and more frequent and increase in force and painfulness. The patient often vomits or shivers during this stage; there is an abundant secretion of urine; the cervix gradually expands till its edges become continuous with the vaginal walls. When the opening measures about three inches, the "bag of waters" usually ruptures, allowing a portion of the liquid to escape, while the remainder is kept back by the ball-valve action of the head. The mechanism of cervical dilatation requires a brief description. The uterus acts in two ways: (1) When it contracts, the intra-uterine area is diminished and the general intra-uterine fluid pressure is increased; (2) after rupture of the membranes, there occurs direct contact between the fundus and the breech. In the normal method of dilatation the waters are abundant and the membranes unruptured. Under these conditions the dilatation is accomplished by the action of the bag of waters only. As fluid pressures are equal and opposite in all directions, it follows that the fetus would not be affected by the intra-uterine fluid pressure. Nor would the uterine contractions have any effect, if the entire uterine surface contracted at one time, and if its walls were of uniform strength. The beginning of dilatation of the os depends upon the relative weakness of the lower uterine segment and the peristaltic nature of the uterine contractions.

Not only is the lower uterine segment relatively weak, but that part of the uterine area which is opposite the vagina is not supported by the general intra-abdominal pressure nor by the abdominal muscles. The solution of continuity at the os itself adds to the weakness. There is, therefore, a natural tendency toward dilatation of the os. The peristaltic character of the uterine contractions passing downward from the fundus to the cervix results in a contraction of the upper portion of the uterus while the lower uterine segment is in a state of relaxation. As the internal os and upper portion of the cervix dilate, a new mechanism comes into play through the bulging of the bag of waters through the os. This brings hydrostatic pressure to bear directly upon the margins of the os, and the process of dilatation proceeds with greater rapidity. The internal os becomes effaced, the cervix shortens and disappears, and then the membranes act directly upon the external os. The force exerted by the membranes is directly proportional to their convexity. This explains the well known fact that the last stages of dilatation are usually much more rapid than the early stages. It is evident, then, that in the normal form of dilatation the progress of the first stage of labor depends upon the general intra-uterine fluid-pressure, and that the membranes are the dilating agent.

The Second Stage of Labor, or the Stage of Expulsion, varies in duration from a few minutes to six hours. In primiparæ the average duration is

from two to three hours, in multiparæ from one to two hours. With the onset of the second stage the character of the pains changes. They are more severe and are bearing-down in character. The diaphragm and the abdominal muscles are now brought into play. Bracing herself for every pain, and tightly grasping whatever support may be at hand, the woman strains every muscle to expel the fetus. Her cry is the groan of great effort, followed at the end of the pain by a moan. When the perineum is reached, the pelvic floor bulges with each pain and then recedes as the pain subsides. Finally the presenting part becomes so firmly fastened under the symphysis that it cannot recede. The vulva now gapes with each pain, and the presenting part is seen. The pains now become almost continuous and the head is driven through the external opening. After the birth of the head there is a pause of from one to five minutes. The next pain usually expels the trunk, followed by a gush of liquor amnii, with some blood.

The Third Stage of Labor, or the Placental Stage. The average duration of this stage is from twenty to thirty minutes. After the completion of the second stage the uterus may be felt in the hypogastrium as a firm, round, ball-shaped body. More or less tonic contraction should normally be present. The control of hemorrhage is primarily due to the constriction of the blood vessels by the tonic uterine contractions, and secondarily to the coagulation of the blood at the placental site. Partial detachment of the placenta normally oc-

curs at the time of the expulsion of the fetus. The uterus contracts down upon the placental mass and folds it upon itself, so that the long axis of the placenta corresponds to the long axis of the uterus. The placenta is then expelled with its lower margin presenting. This is the normal method of placental expulsion. Occasionally, especially when traction has been made upon the cord, the centre of the fetal surface presents, like an inverted umbrella. Placental expulsion may occur just after the birth of the child, but in the majority of spontaneous placental deliveries there is an interval of twenty to fifty minutes between fetal and placental delivery. During this time the uterus should remain moderately hard, and intermittent contractions should be present, thus causing the uterus to vary in hardness. Finally a genuine pain occurs and a little blood is expelled from the vagina. Succeeding pains completely separate the placenta and force it down so that it lies partly in the cervix and partly in the vagina. The contractions of the abdominal muscles, aided by the contractions of the uterus and vagina, complete the delivery.

Labor, Normal, the Management of. The key to the successful management of labor is imitation of nature. It should not be understood, however, that the physician should sit idly by and trust to nature to successfully complete a labor, which she is manifestly unable to accomplish. The whole process of labor is so arranged that sepsis cannot occur under normal conditions. It should be the

aim of the obstetrician to follow this plan of nature and not to interfere without good and sufficient reasons. On the other hand, the physician must thoroughly understand the mechanism of labor so that he may know when interference is necessary. The prolongation of labor beyond a safe limit is a well known cause of subsequent local trouble. Prolonged pressure of the fetal head may cause sloughing of the maternal tissues. Exact rules cannot be laid down, but, when there is no advance of the head with good pains, the advisability of interference should be considered. The necessity for the immediate repair of all lacerations which affect the pelvic floor is now generally recognized. The maintenance of rigid asepsis and antisepsis is of the utmost importance. In this connection the morbidity rate should receive more attention. While the mortality from septic infection has been greatly diminished, the morbidity rate has not been correspondingly decreased.

The obstetric outfit should include the following articles: (1) A douche pan of enamel or agate-ware; (2) two pieces of rubber sheeting, two yards square; (3) three or four dozen soft napkins; (4) one or two pounds of sterilized absorbent cotton; (5) six abdominal binders; (6) some old linen for the baby's eyes and mouth; (7) four ounces of boric acid, powdered; (8) one tube of sterile white vaseline; (9) small and large safety-pins. To this list should be added four to six large sterilized bed pads. Chloroform, sublimate tablets, ergot and green soap are carried by the physi-

cian. The mother's outfit and the baby's outfit depend so much upon the social condition of the patient that no detailed description is necessary. The *physician's obstetric bag* and what it should contain furnishes a topic of much interest. There are strong objections to the ordinary obstetric bag, and yet the ideal obstetric case made entirely of metal is so heavy and at the same time so expensive that it will never come into ordinary use. The articles which the obstetric bag should contain have already been enumerated. The *obstetric nurse* should be free from any skin disease of a suppurative nature and from purulent coryza, and should not have recently attended cases of infectious disease, especially erysipelas, scarlatina, diphtheria, or typhoid fever.

The Lying-in Room should be large and well-ventilated, and should be removed as far as possible from drains and water-closets. A sunny room is always preferable. The room should not have been occupied by anyone suffering from any infectious disease. All unnecessary furniture and draperies should be removed. The temperature of the room should range from 66° to 72° F.

The Labor Bed. The bed should not be too low and should be accessible from both sides. A firm, hair mattress is desirable. If operative interference is necessary, it is preferable to deliver the patient upon a table. The bed is protected by a large rubber sheet. Over this is spread a clean muslin sheet and both coverings are pinned firmly to the mattress. This constitutes the permanent

labor bed. A second rubber sheet overlaid with a bed-sheet is spread over the first coverings. These coverings constitute the temporary bed and are removed after labor. Above the second sheet is placed a large absorbent pad to receive the discharges. An excellent substitute for the absorbent pad is the Kelly rubber-pad.

The Nurse's Preparations. The nurse should have ready for the physician a small table covered with one or two clean towels and supplied with a wash-basin, a hand-brush, soap and hot water, antiseptic tablets, scissors, sterilized tape for the cord, and an aseptic lubricant for the hands. The nurse should also provide plenty of clean sheets and towels, a change of night-clothing, warmed, for the patient, a warm blanket for the child, and an abundant supply of hot water.

The Preparation of the Patient. The pubic hair, especially when long and thick, should be clipped moderately short. A full enema of soap-suds and glycerine should be given. The patient should take a bath at the beginning of labor and put on clean linen. The external genitals may be cleansed with soap and hot water and finally with sublimate solution 1 to 2,000. A vulval pad is then applied as a temporary occlusion dressing. The ante-partum vaginal douche is not advised, except in cases in which pathological conditions are known to exist.

Examination During Labor. The external examination should be made before the internal. External examinations should be made between

pains. Important facts to be noted are (1) the position and presentation; (2) the rate and character of the fetal heart-sounds; (3) the condition of the bladder; (4) the size of the fetal head and its engagement or possible engagement into the pelvic brim. After the external examination the patient is prepared for the internal examination. The patient is placed in the dorsal position, with thighs flexed. The external genitals are cleansed with 1 to 2,000 sublimate solution. The labia are separated with the thumb and finger of the left hand, and two fingers of the right hand are inserted directly into the vagina without coming into contact with anything which could render the hand septic.

In the first vaginal examination we strive to determine (1) the condition of the vulva and vagina as regards dilatability and the presence of lubricating mucus; (2) the condition of the cervix as to dilatability and the degree of dilatation; (3) the size and protrusion of the bag of waters and whether it becomes tense during a pain; (4) the presentation and position of the child; (5) the effectiveness of the pains on the os, membranes, and presenting part. The frequent repetition of vaginal examinations should be avoided. Some danger of infection is always present even with the greatest precaution. One careful examination early in the first stage and another after the rupture of the membranes should be sufficient in normal cases.

Management of the First Stage. During this

stage in normal cases the patient should be allowed the liberty of the room. Too much walking, however, should not be permitted before the head has engaged. As soon as the os is nearly dilated, and the membranes are about to rupture, the patient should be placed in the dorsal or lateral recumbent position. The physician need not remain in the lying-in room during this stage, but in multiparæ and rapidly progressing labors he should be within speedy call. In prolonged labor the patient should be encouraged to take small quantities of liquid nourishment, such as milk, or milk and seltzer, or simple broths. Water should be allowed to any reasonable extent. If nausea or vomiting occur, very hot clear tea or black coffee will be useful. The patient should empty the bladder at frequent intervals. The use of the voluntary forces of labor during this stage should be discouraged. All manipulations for the purpose of accelerating the labor should be avoided.

Management of the Second Stage. At or near the end of the first stage the patient should be placed in bed and should not be allowed to rise for any purpose whatever. The night clothing should be drawn up and pinned at the shoulders to prevent soiling. An ordinary bed-sheet may be pinned around the waist like a skirt as a further protection against soiling. The use of the voluntary muscles to re-inforce the uterine contractions is of material assistance in this stage. The patient should be instructed to hold her breath and to

bear down with the pains. To assist the patient to the full use of the auxiliary forces, it is helpful to allow her to pull upon the hands of the nurse or physician, or to pull upon slings made from a sheet or stout roller bandage fastened to the bed below the feet. For too rapid expulsion give an anesthetic and forbid the patient to bear down. A snug abdominal binder will often aid the progress of labor in multiparæ with lax abdominal walls. The membranes as a rule rupture spontaneously. When dilatation is complete and the membranes have not ruptured they should be ruptured by the physician. The early rupture of the membranes for the purpose of accelerating labor is unwarrantable and harmful. The membranes may be ruptured artificially by the finger-nail or by a hair-pin which is first straightened and then well flamed. Vaginal examinations during the second stage should be avoided as far as possible. Frequent examinations expose the patient to possible sepsis. The most important part of the management of the second stage is to prevent perineal rupture. Rupture of the fourchette is of frequent occurrence in primiparæ, but deep perineal tears in normal cases can be avoided by proper management. The causes of perineal laceration are relative disproportion in size between the presenting part and the pelvic outlet; too rapid expulsion; and faulty mechanism, whereby a larger circumference of the presenting part than necessary passes through the outlet. If disproportion exists abundance of time must be given to

allow sufficient stretching of the muscles of the pelvic floor. If a deep rupture appears inevitable, episiotomy, properly performed, is the method of treatment. The most successful methods for the prevention of perineal tears aim to accomplish the following results: (1) to prevent too rapid expulsion; (2) to preserve the normal mechanism of delivery; (3) to deliver the head between pains. Too rapid advance of the head is prevented by instructing the patient to refrain from bearing-down, to breathe rapidly during the pains, and to cry out as the head emerges. The retardation of the presenting part by the hand of the physician and the administration of chloroform or ether are the other measures available to prevent rapid expulsion. No attempt should be made to support the perineum directly, and all manipulations within the rectum should be carefully avoided.

The normal mechanism of labor should be secured so that the smallest possible diameters of the presenting part pass through the outlet. The delivery of the head between pains secures the advantage of a relaxed pelvic floor.

Methods of Perineal Protection. It is generally admitted that the lateral position is most favorable. The force of violent pains is diminished and the perineum is under direct inspection. After delivery the patient must be immediately changed to the dorsal position to avoid the danger of air embolus.

Method one. With the patient in the left lateral prone position the physician seated behind the pa-

tient passes the left hand and forearm over the right thigh of the patient, and uses the fingers of this hand to retard the progress of the presenting part. Two or three fingers of the right hand applied to the presenting part below help to control the expulsion of the head.

Method two. The posture of patient and physician is the same as in the first method. The left hand is used as before. The fingers of the right hand placed on each side of the coccyx push the presenting part strongly upward as close to the sub-pubic ligament as possible. Extension and delivery of the head should not be permitted until the occipital protuberance has descended below the arch of the pubes.

Method three. The head is made to distend the vulva sufficiently to enable the middle finger of the perineal hand to obtain a point of pressure upon the forehead of the fetus by reaching behind the anus. The thumb and index finger of the same hand on opposite sides of the vulva draw the labia inward and backward and prevent undue strain upon the posterior commissure. Thus the head is slowly shelled out through the vulvar opening. Moderate pressure upon the fundus is helpful. After the delivery of the head the eyes should be carefully cleansed and the mouth wiped out. Search should be made for a loop or loops of the cord about the neck. If the loop cannot be enlarged sufficiently to draw it over the head, ligatures should be applied and the cord cut between the ligatures. Natural expulsion of the shoulders

and body should be awaited unless the condition of the child or mother demands immediate delivery. The head should be supported in the flat of the hand. To protect the perineum during delivery of the shoulders hold the head in the hand and gently raise it so as to bring the anterior shoulder well up behind the symphysis. In this manner the posterior shoulder is born first. If there is any delay in the delivery of the shoulders, make traction directly downward with the hands placed on the sides of the head. If this does not succeed, traction may be made by a finger in the axilla. After delivery of the shoulders the body, usually, quickly follows. If there is any delay, pressure upon the fundus is a better procedure than dragging the child out from below. The fundus must be followed down by the hand of the physician during the expulsion of the fetus. If the child cries vigorously, no treatment is necessary, and it should be allowed to rest between the mother's thighs until the cord is ligated. It should be placed upon the right side and with head low. When respiration is fully established, and the pulsations in the cord have ceased, the cord should be ligated. Strip away the gelatin of Wharton for a distance of two or three inches and ligate with sterile tape about one and one-fourth inches from the umbilicus. A second ligature is placed about two inches from the first. The object of this second ligature is to retain blood in the placenta so that the uterus may more readily expel it. The cord is now divided close to the first ligature. The stump of the

cord is dried with sterile gauze, and a dry dressing of absorbent cotton or gauze is applied.

To prevent ophthalmia two drops of a two per cent. solution of nitrate of silver are dropped into each eye. This is a useful precaution in private as well as hospital practice. An antiseptic dressing of several folds of sterile gauze should be placed over the vulva, and the patient is allowed to rest until the placenta is delivered.

Management of the Third Stage. The duties of the obstetrician in the management of the third stage of labor are exceedingly important. There is a tendency to hasten the completion of the third stage. This should be avoided, and time should be given for the placenta to separate. This may take at least half an hour and should be patiently awaited. In normal cases all manipulations within the vagina for the purpose of hastening the birth of the placenta must be carefully avoided. The fundus should be firmly held by the physician or competent nurse from the time of the expulsion of the fetus. Forcible kneading of the uterus is not required unless there is a tendency to relaxation. Common errors in the management of this stage of labor are: (1) undue haste in the completion of the third stage; (2) the neglect to investigate the condition of the bladder; (3) to press the uterus forward against the pubis instead of downward and backward; (4) to excite contractions instead of waiting for the natural ones. If the placenta is not expelled after a reasonable time, the Credé method should be employed. By this

method the fundus is grasped with one hand, fingers behind and thumb in front. When a contraction comes, the uterus is firmly compressed and thrust downward and backward into the pelvis. It may be necessary to repeat this procedure several times before the placenta is expelled. After the placenta is delivered, it should be held in the palm of the hand until the membranes come away. No traction should be made and the last string of membrane should be rather squeezed out than drawn out. Retained fragments of membrane, if in the vagina or hanging from the cervix, should be removed. Fragments of membrane remaining wholly in the uterine cavity should be allowed to remain unless they give rise to hemorrhage. The fundus should be held for one hour after delivery. The placenta and membranes must be carefully examined to see if they are complete. The third stage of labor is not complete until uterine retraction is fully established. The use of Ergot at the close of labor to promote firm retraction of the uterus is common, and there is no valid objection to this treatment. It is especially useful after chloroform anesthesia, as there exists a tendency to relaxation. The dose of Ergot is one-half to one drachm of a reliable fluid extract by the mouth or twenty minims by hypodermic. The use of the post-partum douche is debatable, but is practically free from danger, if properly given. It certainly adds to the comfort of the patient. After the completion of the third stage the external genitals should be carefully

cleansed with boiled water and an antiseptic solution. The temporary bedding should be removed, and clean clothing supplied. A sterile napkin should be applied to the vulva and the abdominal binder adjusted. This binder should be of unbleached muslin and wide enough to reach from below the trochanters to the lower ribs. The physician should not leave the patient until good uterine contraction has been secured and the pulse is below 100. Directions for nourishment should be left with the nurse, all visitors excluded, the room darkened, and the patient allowed to secure as much sleep as possible.

Labor, Premature, Methods of Inducing.

(1) *Catheterization of the Uterus (Krause's Method)*. The vagina and cervix are carefully disinfected. A solid bougie is sterilized. The patient is placed in the lithotomy position. One, or, if possible, two fingers of the operator's left hand are passed into the cervix, which has been drawn down by a volsella forceps. The bougie is passed by the right hand under the guidance of the fingers in the cervix between the membranes and the uterine wall posteriorly, or in the direction of the least resistance. The bougie should be inserted to within a short distance of the fundus. A light vaginal packing of gauze holds the bougie in position. Labor usually begins in from twelve to twenty-four hours. If labor does not begin in twenty-four hours withdraw the bougie, give a vaginal donche, and insert a new bougie in a position opposite to the first. This method may be

combined with a gauze packing of the lower part of the uterus. This combined method rarely fails to induce labor within twelve hours.

2. *Tamponade of the Vagina and Cervix.* The cervix may require some preliminary dilatation by a steel dilator until it will admit the finger. The cervix is then packed with gauze and the vagina tamponed.

3. *Tamponade of the Uterine Cavity.* The cervix is dilated, if necessary, and then by means of a uterine packer, a quantity of sterile gauze is forced between the membranes and the uterine walls. This method is usually effective.

4. *Hydrostatic Bags of de Ribes, Barnes, etc.* These bags give excellent results. The Voorhees modification of the Champetier de Ribes bag is the best model. A certain amount of dilatation the cervical canal is a necessity in this method.

5. *The Intra-uterine Injection of Glycerin (Pelzer's Method).* The injection of glycerin between the membranes and the uterine walls withdraws fluid from the amniotic sac by osmosis, and the resulting shrinkage of the ovum causes uterine contractions. This method is usually effectual, but is not entirely free from danger.

6. *Circular Detachment of the Membranes (Hamilton's Method).* This method consists in the digital separation of the membranes for a short distance above the internal os. This method is not very certain in its results, but may be used as an adjuvant to other methods.

7. *Artificial Rupture of the Membranes (Scheele's*

Method). This method should not be used after the fetus is viable.

8. *The Vaginal Douche (Method of Kiwisch)*. A stream of water at a temperature of 106° F. is directed against the cervix with considerable force. This is continued for ten or fifteen minutes three times in twenty-four hours. This method is extremely uncertain.

9. *Cohen's Method*. This method consists in the injections of warm water between the membranes and the uterine wall. Cases of sudden death have been observed in the use of this method, and it is not to be advised.

10. *Electricity*. The faradic current and even the galvanic current have been used. This method is slow and unreliable.

The best methods are catheterization of the uterus combined with uterine and vaginal packing, or the insertion of a Champetier de Ribes bag or one of its modifications.

Lacerations, Cervical. Lacerations of the cervix are inevitable in primiparæ. Deep tears of the cervix are due to organic rigidity, or to the extraction of the head by forceps or version through a cervix which is not completely dilated. The vast majority of cervical tears are longitudinal and may be single, bilateral or rarely multiple. Circular lacerations may occur nearly or quite severing the cervix from the body of the uterus. Deep lacerations of the cervix may extend into the vaginal vault. The principal symptom of ruptured cervix is hemorrhage. Some of the larger branches of

the uterine artery may be torn. The diagnosis is made by careful inspection and palpation. If the hemorrhage is profuse, immediate suture of the tear is the proper treatment. The instruments required are two pairs of volsellum forceps, a needle holder and large curved needles. The patient is placed in the lithotomy position, and the uterus depressed by external pressure over the fundus. The anterior and posterior lips of the cervix are seized by the volsellum forceps. The first suture should be passed just above the upper angle of the wound and tied. This controls the hemorrhage. Other sutures are passed at intervals of half an inch as in the secondary operation for laceration of the cervix.

Lacerations, Perineal. A better term than perineal lacerations is lacerations of the pelvic floor. These injuries comprise ruptures of the fourchette, posterior vulval commissure, perineum, lower third of the posterior and lateral vaginal walls, and the recto-vaginal septum. Three degrees of laceration are ordinarily described. In the first degree the laceration extends from the posterior vulval commissure for a variable distance into the perineal body; the second degree extends to the sphincter ani, while in the third degree the rupture involves the sphincter ani and the recto-vaginal septum. The lacerations in the vaginal sulci are really of the most importance owing to the weakening of the pelvic floor. A central rupture of the perineum may occur, and in rare cases the child may be delivered through the tear. The type of laceration

most frequently encountered is one that runs nearly in the median line externally, and extends upward into the vagina on one or both sides. It is usually asserted that some injury to the perineum results in 30 per cent. of first labors, and in 10 per cent. of subsequent ones. These figures refer to cases delivered in maternity hospitals under intelligent treatment. The causes of perineal rupture have already been described. The diagnosis is made by inspection and palpation, the parts being put on the stretch. The results of rupture of the pelvic floor are manifold and far-reaching. The possibility of septic infection is always present. If the rupture is unrepaired, the anterior wall of the vagina sags down, dragging the uterus with it. The outlet of the vagina becomes more open and allows the posterior vaginal wall to prolapse. Incontinence of feces results from rupture into the rectum. The time to repair these lacerations is at the close of labor unless the condition of the patient forbids. Some authorities advise the placing of the sutures while waiting for the delivery of the placenta. This can be done successfully in simple cases only. Great care is necessary in regard to asepsis, but chemical antiseptics are not advisable. Irrigate the field of operation with saline solution or boiled water, and sponge with sterile gauze. Approximate the torn surfaces with tenacula in order to appreciate the extent and character of the injury. Snip away with the scissors necrosed tags or bruised bits of tissue, and leave no pockets for the collection of stagnant

secretions. Anesthesia is usually necessary in complicated cases. The patient is placed in the lithotomy position, with the hips well over the edge of the bed or table. The upper part of the vagina is packed with sterile gauze to check the flow of blood. The instruments needed are: needle-holder; small and medium-sized curved needles; a pair of scissors; a speculum or retractor for the anterior vaginal wall; suture material. Silk, silkworm-gut, catgut, or silver wire may be used for the sutures. Catgut is preferable for the vagina, but silkworm-gut is the best for the outside sutures. In lacerations of the first degree the wound is closed from above downward by interrupted sutures, the needle being introduced close to the upper angle of the wound near its margin, not appearing in the wound but emerging at a corresponding point on the opposite side. In lacerations of the second degree the anterior vaginal wall is drawn up by a retractor. The vaginal lacerations are sutured from above downward with catgut. In order that the lower portions of the wound may be lifted up and brought into contact in the same relative positions which they previously occupied, the Emmet suture should be used. The needle is passed downward until it appears in the deepest portion of the wound. Then the needle is reëntered at the point of exit and carried upward again until it appears at a point on the opposite side of the laceration corresponding to that at which it first entered. The sutures below the first are passed at intervals of one-half

inch. Care should be taken to give the suture a wide circular sweep so as to include sufficient tissue to tightly close the wound. After the sulci have been closed in this manner the raw surface remaining is closed by a crown suture which transfixes the end of the posterior column of the vagina, or two or three interrupted sutures may be used. The sutures must be tied tightly enough to coapt, but not to constrict, the parts. The proper repair of lacerations of the third degree usually requires the services of a skilled surgeon. The rectal tear is first closed from above downward. Catgut is preferred for the rectal sutures, and the knots are tied in the rectum. The ends of the sphincter usually retract into the tissues after rupture, and they must be drawn out with tenacula and carefully united with two or three fine catgut sutures. One or two sutures of silk or silkworm-gut should be passed through the external skin beyond the torn ends of the sphincter above the angle of the tear to emerge at a corresponding position on the opposite side. The remaining laceration is practically one of the second degree, the treatment of which has been described. The after-treatment of the wound is highly important. Avoid the use of the catheter if possible. Cleanliness of the parts is an absolute pre-requisite to union by first intention. After urination or defecation the parts should be washed with a weak sublimate solution. The bowels should be kept open after the second or third day. The sutures should be removed about the eighth or tenth day.

Lacerations, Vaginal. As already stated, there is always more or less laceration of the posterior vaginal wall in deep perineal ruptures. There are, however, lacerations of the vagina apart from these. The tear in the vagina may be superficial, involving the mucous membrane only, or it may extend through the muscular coat of the vagina and may cause a vesical or rectal fistula. If the tear is in the upper portion of the vagina, the peritoneum may be exposed or the abdominal cavity may be opened. These injuries to the vagina are caused by the rapid passage of the fetal head, by a narrow and unyielding vagina especially in elderly primiparæ, and by the use of forceps in unskilled hands.

Deep lacerations of the vagina allow the entrance of the lochial discharge into the cellular tissue, and the liability to pelvic inflammation and pelvic abscess is strong. Superficial lacerations may heal spontaneously, but frequently they become infected and form puerperal ulcers which finally heal by granulation. The treatment of these vaginal lacerations is their prompt repair by sutures at the time of labor. Penetrating wounds which lay bare the cellular tissue must be kept clean by frequent irrigations with an antiseptic solution, followed by packing the wound with iodoform gauze. Vesical and rectal fistulæ should be promptly repaired, if the extent of the injury can be defined. In cases of sloughing this can not be done, and it will be necessary to wait for the secondary operation, which should be performed as soon as possible.

Lacerations, Vulvar. The most frequent injuries to the vulva are tears of the mucous membrane in the region of the vestibule and the inner surfaces of the labia minora. These tears are sometimes near the urethral orifice and may extend into it. From this source may arise burning on urination or retention of urine from swelling. These injuries to the vulva do not cause much hemorrhage unless the plexus of veins known as the bulb of the vestibule is involved.

Superficial tears of the mucous membrane heal without much treatment. Cleanliness and the application of some antiseptic powder constitute the treatment. Deep lacerations and those followed by hemorrhage should be closed with fine silk sutures. The stitches may be removed on the fifth day.

Lactation. Important changes take place in the mammary glands during pregnancy. They become enlarged by growth of the acini, by deposits of fat, and by swelling and proliferation of the connective tissue. The mammary secretion of the first days after labor is termed colostrum. It is a viscid fluid of a lemon-yellow color and is richer in fat, sugar, and the inorganic salts than the fully developed milk-secretion. It has a laxative effect upon the child due, perhaps, to its indigestibility. The true milk-secretion begins usually on the second day in multiparæ, and on the third day in primiparæ. The mammary glands become swollen, more or less painful, the veins are prominent, and the axillary glands are frequently en-

larged and tender. The average composition of normal human milk is: fat, 4 per cent.; sugar, 7 per cent.; proteids, 1.5 per cent.; inorganic salts, 1.4 per cent.; water, 86 to 87 per cent. These percentages vary considerably in the same individual under the influence of diet, general condition of health, and emotional disturbances, but within moderate limits such variations do not disturb the child's digestion. The quantity of milk may be increased by attention to the general health of the mother and by allowing plenty of fluids. Too much rich food and lack of exercise will cause the milk to contain too high a percentage of proteids, a frequent cause of indigestion in the nursing infant. Overwork and improper diet will cause the milk to be poor in quality, while a neurotic taint in the mother may cause the milk to disagree with the child on account of the abnormal composition of the milk. The liquid portion of the milk is derived, with some modification, from the blood; the fat, sugar, and casein are products of metabolic changes in the secreting cells of the mammary glands. The fat is held in suspension in the liquid portion forming a fine emulsion. The average normal period of lactation is about one year. In most nursing women the quality and quantity of the milk begin to fail after the seventh or eighth month.

Lithopedion. A dead fetus remaining in the uterus or in extra-uterine cysts may become infiltrated with calcareous matter until it resembles a stone. Such a fetus is termed a *lithopedion*, or

“stone-child.” Cases are on record where a fetus in this state has been retained for many years.

Lochia, the. The genital discharges which continue for two or more weeks after delivery are termed the lochia. For the first three or four days the term *lochia rubra* (*red lochia*) is applied to the discharge, which consists principally of blood and blood-clots with some epithelial debris and fragments of decidua. For the next three or four days it is mainly serous in character and is called the *lochia serosa*. After about seven days the discharge becomes thicker and whiter in color and is called the *lochia alba* (*white lochia*). This lochia alba contains disintegrated tissue from the birth canal, the secretions from granulating wounds, and micro-organisms. Under normal conditions the uterine lochia is to be regarded as sterile, but the vaginal secretions are not sterile. The average amount of lochia for the first eight days is about three and a quarter pounds. It is greater in multiparæ than in primiparæ, and is more profuse and lasts longer in women who do not nurse their children than in those who do. A diminution in the usual amount of the discharge should excite the suspicion of sepsis. After the first two or three days the lochia has a peculiar sickish, but not putrid, odor.

Lymphangitis, Puerperal. See *Infection, puerperal*.

Maceration, Fetal. See *Death of Fetus in Utero*.

Malaria in Puerperal State. See *Fever in the puerperal state not due to sepsis*.

Mania, Puerperal. *See Insanity, puerperal.*

Mastitis. *See Breast, Diseases of.*

Mastitis in New-born Child. *See Infant, new-born.*

Measles in Pregnancy. Measles is not a common complication of pregnancy. The symptomatology of the disease occurring in pregnancy does not differ essentially from that commonly observed. Abortion is favored by high temperature and cough paroxysms. It is claimed that the tendency to post-partum sepsis and hemorrhage is increased by the occurrence of measles. The infection of measles may be transmitted to the child *in utero*. The percentage of abortions in the limited number of cases reported is high.

Measurements, Pelvic. *See Pelvimetry.*

Meconium. *See Infant, new-born.*

Membranes. At term the fetus is surrounded by three membranes, two of which are of fetal and one of maternal origin. Their order from within outward is: Amnion, and chorion of fetal origin, and decidua reflex and vera of maternal origin.

Meningocele. *Meningocele, or Cerebral Hernia,* is a tumor in which there is a protrusion of the cerebral membranes through an opening in the skull. It occurs usually in the occipital region, occasionally at the root of the nose, or one of the fontanelles. The tumor varies in size from that of an olive to an egg-plant. The tumor is always congenital; generally it is round and elastic, soft and fluctuating. It is always in or near the median line. There is pulsation synchronous with

that of the heart. Convulsions or even coma may result from compression. After birth the tumor should be carefully guarded from any friction or injury. These tumors do not often obstruct delivery, for, on account of their position, they are expelled either before or after the head itself.

Metritis, Puerperal. *See Infection, puerperal.*

Milk, Maternal. *See Lactation.*

Miscarriage. *See Abortion.*

Mole, Vesicular. *See Chorion, diseases of.*

Nausea and Vomiting in the Pregnant Woman.

Severe nausea and vomiting in the pregnant woman is at the present time considered to be one of the forms of toxemia in pregnancy, and reference will be made to this subject under that heading. The cases of nausea and vomiting in pregnancy may be roughly divided into three classes.

1. Simple (so-called Physiological) Vomiting.

Slight nausea, with or without vomiting, occurs in fully one-half of all pregnancies, and in the vast majority of primiparæ. The symptom appears as a rule at the end of the first month and subsides spontaneously at the end of the fourth month. The simplest form of this disorder presents nausea and vomiting or retching in the morning only. The woman is usually able to eat breakfast and has no further trouble during the day. In the next higher degree the woman vomits during or after the meal. She is usually able to continue eating and to retain the food. In a still higher degree the nausea persists for a number of hours,

often accompanied by salivation and distress in the stomach. All these cases, however, are amenable to treatment and do not interfere seriously with nutrition.

2. *Hyperemesis*. When the vomiting is more persistent than has been described, and associated with drowsiness, nightmare, etc., and with some interference with nutrition, we may term the condition hyperemesis. As long as this state can be controlled by proper treatment, the vomiting should not be called pernicious. Recent authorities are inclined to look upon this type of vomiting with suspicion as the expression of a mild toxemia of pregnancy.

3. *Pernicious Vomiting*. Up to a very recent date this term has been applied to a continuous condition of emesis in the pregnant, which leads in a few weeks to gradual death by starvation. The present view upon this subject is that pernicious vomiting of pregnancy is caused by a general toxemia affecting principally the great organs of excretion, the liver and the kidneys, and causing pathological changes which can be readily demonstrated at autopsy. This view is rapidly gaining ground, and its correctness will probably be conclusively proved within a few years.

Etiology. The predisposing causes of nausea and vomiting in pregnancy are to be found in a congenital irritability of the nervous system, in uterine irritation, due to compression of the uterine nerves by the growing uterus, and in the toxic nature of the blood in pregnancy. Diseases of or-

gans remote from the pelvic organs may be the cause of the vomiting. Thus *gastritis*, *gastric ulcer*, and even *cancer* of the stomach must be excluded in determining the cause of nausea and vomiting. The significance of disorders of the liver and the kidneys in the causation of nausea and vomiting has already been mentioned. Intestinal obstruction, and peritonitis (usually tuberculous), are possible causes. Various local affections of the genital organs are enumerated as causative factors. Thus displacements of the uterus, diseased conditions of the cervix uteri, tumors of the ovary, salpingitis, and endometritis have been held responsible for the occurrence of nausea and vomiting of the pernicious type. The most that can be said in regard to these causes is that the vomiting may be due to pelvic irritation, but there is always the possibility that the strong mental impression produced by the treatment instituted for the relief of local pelvic disorders may be the curative element in the case. If we can exclude the presence of organic or functional affections which cause vomiting in the non-pregnant, and if all anomalies of the uterus have been corrected without any improvement in the woman's condition, we may consider the case one of uncomplicated pernicious vomiting, and due to the toxemia of pregnancy.

Symptomatology. Three stages are commonly described. The earliest symptoms consist of slight repugnance toward certain articles of food with a craving for others not usually liked. Vomiting

soon follows, the patient having as many as twenty or thirty attacks in twenty-four hours. At first only articles of food are ejected, but eventually mucus, bile, and, in severe cases, mucus stained with blood, or a dark coffee-ground material, are vomited. The patient becomes constipated, loses flesh rapidly and develops great weakness. As the *second stage* begins a rise of temperature occurs toward evening. This is probably due to auto-intoxication. All the symptoms increase in severity; the temperature ranges between 101° and 103° F., the pulse from 120 to 140. In other cases, although the skin is hot and dry, the pulse rapid and small, and urine scanty, the temperature is but slightly elevated. There is great dryness of the mouth and throat, and the tongue is covered with a thick dark-brown crust. Sordes appear on the teeth, and the breath is extremely offensive. Albumin and casts appear in the urine. There is tenderness over the epigastrium and over the uterus. The emaciation is progressive, and the extreme weakness is shown by attacks of syncope when the patient attempts to rise. If the patient once develops the symptoms of the *third stage* it is considered almost impossible to save her life. Vomiting is less marked and may even disappear. The other symptoms, however, do not improve. The pulse is still weak and rapid, thirst is extreme, the skin is cold and clammy, the abdomen collapsed. Symptoms of cerebral origin develop. Intense headache or neuralgia, impairment of sight and hearing, contracted pupils, and twitch-

ing of the limbs. Somnolence and coma soon follow, and death ensues in a few days. The duration of pernicious vomiting is sometimes two or three months. It is unusual for death to occur within a month from the onset of the symptoms.

Treatment. If the cause of this malady is believed to be a toxemia depending upon hepatic insufficiency and a toxic state of the blood, it is evident that eliminative treatment is necessary, and that the toxins in the blood should be diluted as far as possible. To meet these indications the latest authorities advise regulation of the diet, and, if necessary, rectal feeding; full doses of calomel to stimulate the liver to be followed by high enemata of Sulphate of magnesia in saturated solution. Secure free action of the kidneys by diuretics, the free ingestion of plain water, and by colon flushing with normal salt solution; stimulate the skin with hot packs, and use oxygen freely for the lungs. Intravenous injections of salt solution should be given in severe cases.

The older methods of treatment may be summarized as follows:

1. *Dietetic and Hygenic.*

The patient must have kind treatment and pleasant surroundings. In severe cases she should remain in bed and have perfect quiet and rest. Liquid food such as milk and lime-water, eggs, beef-juice, koumyss or clam-broth should be tried. If moderate quantities are rejected, give teaspoonful doses at short intervals. In some cases ice-cold preparations are better retained, while in

other cases very hot milk or broth is more acceptable.

2. *Medicinal*. The number of drugs which have been recommended in the treatment of this disorder is the best proof that the great majority are worthless. Cocaine, Oxalate of cerium, Iodine, Creosote, Dilute hydrocyanic acid, Chloral, Bromides, Antipyrine, Codeine and Morphine are some of the remedies advised by old-school authorities. The Homœopathic remedies are as follows:

Antimonium crudum. Nausea and vomiting, or only nausea, with white-coated tongue. Belching, with taste of what has been eaten. Painful sense of fullness of the stomach, which is sore on pressure.

Arsenicum album. Very great debility and prostration. Very pale, white look. Bitterness in the mouth, particularly after eating or drinking; sensation as of a stone in the stomach. Craves cold water, but she cannot retain it. Thirst for small quantities of water frequently repeated. Vomiting of fluids as soon as she takes them. Nightly vomiting. Very uneasy and restless. Vomiting of blackish or greenish matter. Arsenicum is frequently indicated in severe cases and acts best in the higher potencies. The best method of administration is to medicate No. 10 pellets with the potency selected, and to place the pellets dry upon the tongue.

Belladonna. Face flushed or very pale, eyes red. Throbbing of the carotids; dread of light and noise. A putrid taste arises from the fauces, also

while eating and drinking, although the food tastes natural. Vomiting of bile. The symptoms become worse in the afternoon and evening. Thick coating on the tongue.

Bryonia alba. Nausea on waking in the morning. Dry, parched lips, dry mouth and tongue. Splitting headache. All symptoms relieved by keeping quiet. Worse on sitting up, even sitting up in bed, after being angry, in warm air, from warm weather or from warm food. Better in cool weather or from taking cool food. The remedy acts best in the higher potencies.

Cocculus indicus. Burning in œsophagus extending into the fauces, with a taste of sulphur in the mouth. She is scarcely able to raise herself in the morning from nausea and inclination to vomit, it makes her so faint. Sensation in the abdomen as if sharp stones rubbed together on every movement, and the lower extremities seem almost paralyzed. Yellow-coated tongue, with aversion to food. Fetid eructations. Worse from riding in a carriage or in cars. Painful sensation of fullness in the stomach.

Conium. Wakes in morningsick at the stomach; vomits several times from five o'clock until breakfast. Worse from raising head and especially from turning over in bed. The patient always feels worse after going to bed; she is obliged to sit up or to walk about to get relief. The history of the case reveals the fact that swelling and soreness of the breasts occurred at each menstrual epoch.

Cuprum arsenicosum. Constant nausea. So

weak that she can hardly sit up. Pulse quick and feeble. Spasmodic crampy pains in the uterus and in the extremities.

Gossypium. Nausea on least motion soon after waking with distress in the pit of the stomach. On raising the head retching and violent efforts to vomit. At first very little comes up, but finally saliva and some thick fluid is discharged, and occasionally a little bile, but rarely any food. Wind is passed from the bowels during efforts to vomit. Great prostration of the nervous system. Has been useful in very bad cases.

Ignatia. Great sense of emptiness at the pit of the stomach, with sighing and great depression of spirits. Sensation as if she had been fasting a long time, with flat taste and languor in the limbs. Sour eructations and frequent regurgitation of food and bitter liquids. Worse from the smell of tobacco. Nervous and easily frightened. Effects of grief.

Ipecac. One continual sense of nausea all the time; more nausea than vomiting. Cutting pains about the umbilicus. Disgust for food, empty retching.

Kali bichromicum. Sudden nausea. Discharge from stomach, throat or mouth of a tough, stringy mucus, inclining to stick to the parts and drawing out in long strings.

Natrum mur. Waterbrashlike limpid mucus, profuse and constant. She always awakens in the morning with headache. She craves salt; has a strong aversion to bread. Feeling of great hunger,

as if the stomach were empty, but no appetite. Always has heartburn after eating. Loss of taste or flat, bitter or sour taste.

Nux vomica. Thinks she would feel better if she could vomit. Nausea and vomiting every morning with constipation. Stools very small and frequent, with frequent and painful urging. Food and drink have a fetid smell to her. She cannot bear the odor of tobacco. She is irritable and wishes to be alone. Canine hunger. Aversion to water and bread; longing for beer, brandy, etc. Constant pain and pressure in the pit of the stomach as from a stone. Cannot bear tight clothing around the waist. Jaundice; colic; difficult breathing from upward pressure; frequent urging to urinate; varicose veins; hemorrhoids.

Phosphorus. Nausea aggravated by fasting, drinking at night, or assuming an erect posture. Very weak feeling in the abdomen. Burning in stomach. Unable to drink water; the sight of water causes vomiting. Vomits water or food as soon as it becomes warm in the stomach. Gone-ness in region of stomach as if stomach had been removed. Sour eructations and sour vomiting of undigested food. Vomiting of blood. Constipation with narrow, long, hard, dry feces, or profuse watery diarrhoea, pouring away as if from a hydrant.

Pulsatilla. Pulsations in the pit of the stomach. Frequent eructations of sour, rancid, hot food. Foul taste; nothing tastes good to her. Absence of thirst. Nightly diarrhoea, stools very change-

able. This remedy is especially useful when the stomach is contracted and drawn upwards, pressing on the diaphragm and causing pain under the sternum.

Sepia. Vomiting of milky water or milky mucus. Sense of emptiness at the pit of the stomach; the thought of food sickens her. Eructations tasting like spoiled eggs. Aversion to meat. Inclination to vomit in the morning when rinsing her mouth. Want of appetite. Taste bitter or saltish. Constipation.

Sulphur. Profuse salivation, the taste of which causes nausea and spells of vomiting. Flashes of heat; heat on the top of the head; cold feet. Aversion to meat and craving for brandy. Bitter, saltish or sour taste. Belching; eructations; some vomiting.

Symphoricarpus racemosa. The characteristic symptom is that so long as the patient lies in bed and keeps perfectly quiet, she does not feel the desire to vomit. This remedy acts best in the second or third decimal trituration.

Veratrum album. Much thirst for cold drinks, wants everything cold. Craves fruits and juicy articles of food. Violent retching and vomiting; vomiting of bile. Cold sweat on the forehead with all the sufferings. Feels very weak and faint.

3. *Local treatment*. This includes the correction of malpositions of the uterus, the treatment of diseased conditions of the cervix uteri such as erosions, hypersecretion, etc., and the dilatation of the internal os with the finger, or with a steel

dilator. The induction of labor is indicated when there appears no other way of saving the mother. This procedure should not be delayed too long, as the patient may die from exhaustion, although the vomiting stops.

4. *Rectal Feeding.* This is a valuable method of treatment in some cases. It is impossible, however, to sustain the patient's strength for any great length of time by rectal feeding alone. The injections usually consist of beef-tea, albumin water, defibrinated blood, brandy, milk, and peptones. The rectum must be cleansed by a saline enema one hour before the rectal feeding is given. The nutrient enema must be given slowly, and the patient is instructed to lie quietly in order to retain the enema. Three to five rectal feedings may be given daily. An enema containing six to seven ounces of milk, one or two raw eggs, a teaspoonful of powdered sugar, a large pinch of salt, and a tube of Fairchild's pancreatin has been used with success. Five ounces of minced raw beef, one or two ounces of fresh pancreas, an ounce of butter, and six ounces of water, all well mixed, is another excellent formula. Flint's formula—milk two ounces, whisky half an ounce, with one-half an egg—is useful.

The Nervous System, Diseases of during pregnancy.

Cerebral hemorrhage has little effect upon either gestation or labor. Inflammatory diseases of the brain and its coverings are rare. *Cerebro-spinal meningitis*, like other infectious diseases has an

effect upon pregnancy similar to other infectious diseases. The *mental derangements* of pregnancy have already been discussed under puerperal insanity.

Vertigo is often observed in highly nervous and hysterical women. The condition of the blood during pregnancy is the probable cause.

Insomnia may occur during pregnancy, depending in some cases upon circulatory changes and in others upon the toxemia of pregnancy. The treatment of this symptom in those cases which depend upon circulatory changes consists in the use of warm baths at night to equalize the circulation and the administration of the indicated Homœopathic remedy. If symptoms pointing to the toxemia of pregnancy are present, the treatment appropriate to that condition must be at once begun.

The occurrence of *paralysis* during pregnancy is not uncommon. The nerves of special sense, or the facial nerves, may be affected, or there may be hemiplegia or paraplegia. The occurrence of paralysis suggests the existence of some morbid condition, such as organic heart disease, renal disease with arterial degeneration, or anæmia. Hysteria may cause the development of a false paralysis which may take the form of partial or complete hemiplegia, or disorders of the special senses, especially that of speech. If amaurosis occurs, renal disease should be suspected. Paraplegia may be the result of a spinal disease, or of pressure upon the pelvic nerves by the fetal head.

Hemiplegia due to cerebral lesions comes suddenly like an apoplexy, while uraemic paralysis is preceded for a few hours or days by headache, disturbances of vision, epigastric pain and œdema of the face. Hemiplegia due to organic lesion is often fatal. Death may occur within two or three days, or after a gradual decline. If the patient survives the attack, the pregnancy usually is not interrupted and the course of the labor is not different from normal. The following Homœopathic remedies will prove useful in the treatment of the various forms of paralysis.

For *hemiplegia of organic origin*: *Anacardium*, *Causticum*, *Gelsemium*, *Nux vomica*, *Opium*, *Plumbum*, and *Strychnia*.

For *hysterical hemiplegia*: *Ignatia*, *Gelsemium*,

For *traumatic hemiplegia*: *Arnica*, *Hypericum*.

The *neuralgias of pregnancy* are of common occurrence. The nerves of the head, face, and teeth are the ones usually affected. Neuralgias of the muscles of the abdomen and back frequently occur toward the end of pregnancy, due to excessive stretching. The pain in these cases is referred to the insertions of the muscles. Cramps in the legs, late in pregnancy, and sciatica are due to the pressure of the fetal head upon the sacral plexus of nerves. These neuralgic affections are best treated by the careful selection of the Homœopathic remedy. The remedies most frequently indicated are:

Aconite. Headache or neuralgia with vertigo on rising up in bed. Sensation as if the whole

brain would press out at the forehead. She fears to be in a place of excitement or confusion. Stitching, throbbing toothache. Neuralgic pains from cold winds.

Belladonna. Flushed face, congested eyeballs, with throbbing pains in the head aggravated from motion, noise, light, jarring the head. Pains come and go suddenly. She seems to be in a stunned or stupid condition.

Bryonia. Severe, splitting headache with constipation, coated tongue, mental and physical sluggishness. She wishes to keep very still. Dryness of the lips and mouth. Nausea on rising in bed. Toothache in sound teeth, spreading from tooth to tooth, aggravated from warm food and from warmth in general.

Chamomilla. Unbearable toothache. Great irritability of temper and impatience; redness of one cheek, while the other is normal or pale. Painful jerkings in the teeth.

Chininum sulph. Pain begins at same hour each day. No pain in the interval and no other derangements.

Cimicifuga. Congestive or neuralgic headache over, in, or behind the eyes extending to the occiput. The pain is relieved in the open air and aggravated by heat. Throbbing in the head when ascending.

Coffea. Intense pain, the head feeling contracted, or as if too small. Nervous excitement with sleeplessness, or drowsiness, yet with inability to go to sleep. Agonizing toothache relieved by holding ice or ice-water in the mouth.

Gelsemium. Sharp shooting pains through the face, eyes and head. Dim vision precedes the headache. The face is congested and of a dark, dusky hue. Heaviness of the head; vertigo; stupor; dull expression of the countenance.

Glonoine. Whirling in the head, with giddiness; sensation of expansion of the brain, as though the head would burst. Perceptible throbbing of the carotid and temporal arteries. She feels every beat of the heart in the head. The headache or neuralgia has been brought on by exposure to the rays of the sun, or is aggravated by such exposure. Can not bear the head covered.

Ignatia. Neuralgic headaches in hysterical women disposed to melancholy thoughts and much sighing. Headache confined to one side of the head. Unbearable pain as if something sharp was being forced into the brain. Weak feeling in the stomach. Starts and jumps at least noise.

Kalmia. Excessive pain in the right side of the face and over the right eye, which is weak and watery. The pains are burning in character and return every afternoon.

Mezereum. Neuralgia in the cheek-bone or over the left eye. The pains leave the parts numb and are worse from warmth.

Nux vomica. Headache or neuralgia in pregnant women who are addicted to the use of wine and spirits, or coffee, or who lead a sedentary life. The heads feels as if it would split, and the scalp is sore to the touch. Pressure with the hands on the head relieves the pain. Nausea; accumulation

of gas in the stomach after a meal, and other symptoms of dyspepsia.

Plantago. Shooting, tearing neuralgia in left jaw extending to the ear and back again to the teeth.

Pulsatilla. Hemicrania, occurring in women of mild and gentle disposition, given to weeping. The pain is worse at night, while at rest, and in a close, warm room and is relieved in the open air, by gentle motion, and by bandaging the head.

Sanguinaria canadensis. Neuralgic and bilious headache extending from the occiput, neck and shoulders over the head to the right eye. The pains increase and decrease with the course of the sun, reaching their acme at mid-day. The only relief from the pain is gained by remaining perfectly quiet in a darkened room.

Sepia. Headache over the left eye with aversion to all kinds of food. Feeling of emptiness or gone-ness in the stomach, which is very distressing. In women who have "moth-patches" on their foreheads, who are of sallow complexion, or who have a yellow streak across the bridge of the nose and under the eyes.

Spigelia. Facial neuralgia, generally of the left side of the face, and of very severe type. The pain involves the eyeball and orbit, and the eye of the affected side may be very much congested. The pains are sharp, darting, or lancinating in character, and are somewhat relieved by firm pressure.

For cramps in the legs, consult *Chamomilla*, *Cuprum metallicum*, *Gelsemium*, *Rhus toxicodendron*, *Sulphur* and *Veratrum album*.

For neuralgias in abdominal muscles and lumbago, consult *Arnica*, *Berberis*, *Cimicifuga*, *Pulsatilla* and *Rhus toxicodendron*.

Neuroses, such as *hysteria*, *epilepsy*, and *chorea*, are more or less common affections during pregnancy. Hysteria is frequently observed as the pregnant condition renders the mental balance unstable. Epilepsy is a rare complication, because epileptics are usually sterile, and the epileptic attacks are frequently suspended during the pregnancy. An epileptic seizure may be confounded with an eclamptic attack. Chorea and its treatment has been discussed.

Nipples, sore. See *Breast, diseases of*.

Nursing. See *Lactation*.

Oligo-hydramnios. See *Amnion, diseases of*.

Ophthalmia neonatorum. An acute conjunctivitis occurring in infants, beginning from two to five days after birth. There are two varieties of ophthalmia neonatorum. The first variety may be termed simple or catarrhal ophthalmia and is not a serious disorder. The second, or purulent ophthalmia, is liable to cause serious damage to the eye, and its prompt treatment is of the utmost importance.

Etiology. The causes of a mild or catarrhal ophthalmia may be any non-specific irritant, such as the vaginal secretions; the use of soap or antiseptics, exposure to strong light, or the application of silver nitrate. The cause of purulent ophthalmia is infection either from the gonococcus alone or mixed with other pathogenetic bacteria.

The source of the infection in the great majority of cases is the presence of the gonococcus or other pyogenic germs in the secretions of the genital tract of the mother.

Symptoms. In the catarrhal form the symptoms are those of mild conjunctivitis, with a serous or sero-mucous discharge, but the lids are not swollen and there is no tendency for the symptoms to get worse rapidly. All cases of ophthalmia in newborn infants are, however, suspicious and should be treated as though they were commencing purulent cases.

The symptoms of purulent ophthalmia appear, as a rule, on the third day after birth. The first signs are redness and œdema of the lids. The conjunctiva of the lids becomes greatly swollen and has a granular surface. Soon the conjunctiva of the eye-ball is involved, and chemosis develops. The discharge from the eye at this stage is serous, or sero-sanguinolent. Soon a free secretion of pus begins, and the intense swelling may diminish to a certain extent. The pus may flow freely, or the edges of the lids may adhere, thus allowing the conjunctival sac to be ballooned out by the accumulated secretion. Involvement of the cornea is the most serious complication. It is estimated that 20 per cent. of all the blindness in the world is due to the involvement of the cornea in this disease. An appearance of dullness or cloudiness of the corneal surface is the first sign of danger. Ulceration develops, which may perforate the anterior chamber, or may spread without perforation. In gen-

eral, the more pronounced the chemosis the greater is the danger that the cornea will be involved. Fortunately in infants, if proper treatment is promptly instituted, no serious damage to the eye results in the majority of cases. The swelling, redness, and purulent discharge gradually diminish, though several weeks may be required for complete recovery. Fever is often present and evidences of systemic infection may occur.

Treatment. The treatment of the catarrhal variety consists in cleanliness and protection from light. The use of a Boric acid wash and Boric acid ointment on the lids to prevent them from adhering aids in the prompt recovery, which usually occurs.

The treatment of purulent ophthalmia is prophylactic and curative.

The *prophylactic* treatment is really of more importance than the curative. When gonorrhœa in the mother is suspected, daily or twice daily vaginal douches should be given, first with a mild alkaline solution and then with bi-chloride of mercury, 1:5000. When labor begins give a vaginal douche of lysol, 1 per cent., and repeat this just before delivery. As soon as the child is born, the face must be carefully washed, special attention being given to the eyes, and one or two drops of a 2 per cent. silver nitrate solution should be dropped into each eye. This may be washed away in a short time with salt solution, if desired.

The extremely infectious character of the discharge from the eyes must be always considered,

and every precaution must be taken to avoid the infection of a clean eye. The case must be promptly isolated, and every antiseptic precaution must be rigidly observed. All dressings must be burned after use. If the cornea becomes involved, the assistance of an ophthalmologist should be secured whenever possible.

The *Curative* treatment of purulent ophthalmia should be begun as early as possible. Even a few hours delay makes considerable difference in the outcome of the case. The application of ice-cold compresses, the removal of the pus from the eye at frequent intervals, and the instillation of one of the silver salts constitute the chief remedial agents in the early stages of the disease. The administration of the indicated Homœopathic remedy is exceedingly helpful, but the local treatment is absolutely essential. To keep the eye clear of pus the conjunctival sac should be freely irrigated four or five times a day with a warm saturated boric-acid solution, or a 1-2000 potassium permanganate solution. The silver salt advised in the early stages is a 10 per cent. protargol solution. A few drops of this solution should be instilled once a day. The treatment which has been outlined will control a large majority of the cases of ophthalmia neonatorum. If, in spite of this treatment, the pus becomes more abundant, and the symptoms more severe, more energetic treatment is required. The eyes must be cleansed more frequently, the protargol solution must be increased in strength to 20 per cent. and may be used more frequently,

and the cold applications must be used continuously. As soon as the pads become warm, they must be replaced. In severe cases a silver nitrate solution, 2 per cent. or stronger, acts better than the protargol solution. The everted lids should be brushed with the solution and the residue washed away with salt solution. If the cornea becomes involved, atropin must be used to dilate the pupil. Care must be taken not to disturb the infant any oftener than is absolutely necessary. The child must be kept warm and carefully and regularly fed.

The following Homœopathic remedies may be indicated in the treatment of ophthalmia neonatorum, and, if carefully prescribed, will materially shorten the duration of the disease.

Aconite. In the very first stage. Great redness, chemosis, and profuse purulent discharge, with swelling and redness of the lids and burning heat in the eye.

Apis mel. Great swelling of the lids and adjacent cellular tissue. The conjunctiva is also congested, puffy, and full of dark red veins. The discharge is moderate.

Argentum nit. The most frequently indicated remedy for any form of purulent inflammation of the conjunctiva. The subjective symptoms are almost none. The profuse purulent discharge and the swollen lids, swollen from the accumulated pus, indicate the drug. It may be used in the third or thirtieth potency internally, and, at the same time, five or ten grains of the first, third, or

thirtieth trituration dissolved in two drams of water makes an efficient external application.

Calcarea carb. This drug is especially useful for the results of purulent ophthalmia, clearing up the opacities of the cornea. In the selection of this drug, great reliance should be placed upon the general condition of the patient, as the eye symptoms are not characteristic.

Chamomilla. Often of service as an intercurrent remedy. It is indicated when the child is very fretful, and when the usual symptoms of the disease are present, even though the cornea has been invaded.

Euphrasia. More often indicated in the later stages of the disease than at the beginning. The lachrymation is profuse, acrid, burning, while the discharge from the eye is thick, yellow, muco-purulent and acrid, making the lids and cheek sore and excoriated.

Hepar sulph. The lids are swollen, spasmodically closed, bleeding easily upon any attempt to open them and very sensitive to touch. There is much redness, chemosis, and the discharge is considerable, of a yellowish-white color. When the ulceration is severe, and hypopion has taken place, Hepar is especially the remedy.

Mercurius. The discharges are thin and exco-riating, making the lids and cheek sore and raw. Purulent conjunctivitis in syphilitic subjects. Is more commonly indicated late in the disease, especially if the cornea has become involved.

Nitric acid. Lids much swollen, red, hard and

painful, chemosis, cornea ulcerated, great photophobia, copious discharge of yellow pus, which flows down the cheek. The cheeks are also usually much swollen and painful.

Pulsatilla. Discharge is profuse and bland. A useful intercurrent remedy during the administration of Argent. nit. When improvement under the latter remedy is at a stand-still, a few drops of *Pulsatilla* will materially hasten the cure.

Rhus tox. The lids are red, œdematous and spasmodically closed. The palpebral conjunctiva is especially inflamed, so that when the lids are opened a thick, red swelling appears, with a copious, thick, yellow discharge; or the discharge may be less, and a profuse gush of tears may take place.

Os uteri, dilatation of. The normal mechanism of dilatation occurs when the waters are abundant and the membranes persist unbroken during the first stage. Under these conditions the dilating agent is the bag of waters. Although the lower uterine segment makes an effort at contraction, it is forced open by the more powerful upper portion of the uterus. That portion of the uterus which is opposite the vagina is not supported by the general intra-abdominal pressure nor by the abdominal muscles. The solution of continuity at the os uteri also adds to the weakness of this part of the organ. All these factors help to determine the initial dilatation of the os and the expansion of the lower uterine segment. As soon as the bag of waters begins to bulge through the os, the fluid

pressure acts directly upon the edges of the os. The internal os disappears, the cervical canal shortens and becomes abolished, and then the membranes act directly on the external os. The rapidity of dilatation now depends upon the degree of bulging of the membranes through the os. Fluid pressure is equal in all directions and is exerted at right angles to any surface against which it acts. These facts together with the increasing force of uterine contraction explain the greater rapidity of the last stages of dilatation. The mechanism of dilatation after partial or complete escape of the waters is somewhat different. When the membranes rupture, the liquor amnii tends to drain away until the presenting part comes into contact with the margins of the os. In this condition the presenting part forms a ball-valve, a portion of the waters being retained above the fetus. In the early stages of dilatation the head can exert but little direct expansive force upon the margins of the os. Hence dilatation is apt to be slow after early rupture of the membranes. When the os has dilated to such an extent as to admit the greatest circumference of the head, its action is that of a slightly tapering wedge, which compels an extremely rapid completion of the dilatation, and is liable to cause severe laceration of the cervix. When the waters escape completely at the beginning of labor, the fundus of the uterus comes into direct contact with the breech of the child. The force of uterine contractions is then transmitted directly through the ver-

tebral column to the head. The head acts as the dilating wedge.

Ovaries the, Diseases of, Complicating Pregnancy.

Diseased conditions of the ovary are usually aggravated by pregnancy. Acute inflammation of the ovary is a rare complication of pregnancy, although it may occur from an exacerbation of a chronic process, or by septic infection from a previous abortion. While the tubes undergo a marked hypertrophy during pregnancy, the ovary itself does not. Ovarian tumors are the most common manifestations of disease in the ovaries during gestation. There is always the possible risk that such a tumor may twist its pedicle, and since the operation of ovariectomy is usually successful during pregnancy, ovarian tumors should be removed as soon as their presence is detected. If the tumor is not discovered until the onset of labor, an attempt may be made to push the tumor into the abdominal cavity, if it obstructs the progress of labor. If this fails, tapping may be tried to diminish the size of the mass. If this fails, Cesarean section must be performed.

Palpation, Abdominal. See *Examination, Obstetrical*.

Paralysis in the New-Born Child. Various degrees of paralysis of the face, arms, and legs may occur in the new-born child as a result of cerebral hemorrhage. The cause of the hemorrhage in the great majority of cases is long continued pressure during labor or the unskillful use of the forceps. In

many of these cases death ensues before the paralytic symptoms manifest themselves. In cases which survive the early days of life the usual symptoms of paralysis develop. Contractures and other deformities of the paralyzed muscles frequently occur. Speech is generally impaired, and intelligence is usually somewhat affected. Paralysis caused by injuries to nerve-trunks during labor takes the form of facial paralysis or arm paralysis (Duchenne's paralysis). Traumatic facial paralysis is usually due to pressure by the forceps at or near the stylo-mastoid foramen, but may occur in spontaneous delivery. When caused by the forceps, facial paralysis usually affects one side only. Facial paralysis may be apparent immediately after birth or only after an interval of one or two days. It never becomes worse after it is once established. The prognosis of this affection is good. Most cases recover after a few days or weeks. In cases of extreme injury by the forceps a much longer period is required for recovery, and in a few reported cases the nerve was injured too severely to allow recovery, and the muscles became atrophied. The treatment consists in protecting the exposed eye ball, and, after a time, the employment of massage and electricity. The administration of Arnica in the thirtieth or two hundredth potency is of unquestioned value. Hypericum is another remedy which should be considered.

Cases of arm paralysis are not common. The seat of the lesion in these cases is some portion of

the brachial plexus, especially that corresponding to the fifth and sixth cervical nerves. The etiology of this affection is not clearly understood. The pressure of the fingers in the delivery of the after-coming head by the Smellie-Veit method; the pressure of the clavicle; pressure by the forceps; and the stretching caused by flexion of the head to the opposite side are all assigned as causative factors. In cranial positions the paralysis may result from strong traction in delivering the shoulders, the head being considerably inclined. The prognosis in these cases is doubtful. It is best when the condition is due to simple forceps pressure. If due to traction, the stronger the traction the greater the lesion.

The *treatment* consists in protecting the arm by wool or cotton and a suitable bandage to prevent dragging. After two or three weeks, massage and electricity should be employed. The administration of the indicated Homœopathic remedy will prove helpful, whenever a cure is possible.

Pelvimetry, External and Internal. The external pelvic measurements are of considerable importance in the diagnosis of pelvic deformity. There are, however, many possible errors in the figures obtained by the use of the pelvimeter, even in skilled hands. In external pelvimetry we rely mainly upon five measurements: (1) Interspinous. (2) Intercrestal. (3) The external conjugate. (4) Right oblique diameter. (5) Left oblique diameter. The distance between the great trochanters is another measurement of considerable importance.

The pelvimeters of Baudelocque and of Schultze are good instruments.

To use the pelvimeter the patient should be dressed as for bed and placed first in the dorsal position. The physician, standing on the patient's right side, applies the points of the pelvimeter to the outer edge of the anterior superior iliac spines and notes the diameter indicated upon the scale. This is the *interspinous* diameter. Then the points of the instrument are pushed backward and forward along the iliac crests and the greatest possible diameter noted. This is the *intercrystal* diameter. The patient now lies on her side and one point of the pelvimeter is placed in the depression just below the spine of the last lumbar vertebra, while the other is placed upon the symphysis pubis about $\frac{1}{8}$ of an inch below its upper edge. This measurement gives the *external conjugate* diameter. The oblique diameters are obtained by placing one of the points upon the posterior superior iliac spine, and the other upon the anterior superior iliac spine of the opposite side. The normal lengths of these diameters are as follows:

Interspinous	$9\frac{1}{2}$ to $10\frac{1}{2}$ inches.
Intercrystal	$10\frac{1}{2}$ to $11\frac{1}{2}$ inches.
External conjugate.....	8 inches.
Right oblique.....	$8\frac{3}{4}$ inches.
Left oblique.....	$8\frac{3}{4}$ inches.

It must be remembered that these external measurements are not entirely trustworthy, but they are nevertheless of value. A marked decrease in the interspinous and the intercrystal diameters

point to a transversely contracted pelvis. If the intercrystal diameter is no greater than the interspinal, the pelvis is probably rachitic. A notable diminution in the external conjugate diameter indicates a flattened pelvis. Again, if the external measurements are in the normal proportion to one another, but are all considerably below normal, the existence of a generally contracted pelvis is probable.

Pelvimetry, internal. Many instruments have been devised for internal pelvimetry, but the educated hand is still the best. With the patient in the lithotomy position, the first and second fingers of the examiner's hand are introduced into the vagina and passed well upward toward the promontory. The general contour and capacity of the pelvis, the inclination of the pelvis, the depth, inclination and thickness of the symphysis, the shape and curve of the sacrum, and the flexibility of the coccyx, can all be determined by this internal examination. The internal diameters which may require measurement in some cases are: (1) the diagonal conjugate, (2) the true conjugate, (3) the transverse diameter of the outlet, (4) the transverse diameter of the inlet, (5) the pubo-coccygeal diameter. The diagonal conjugate is the most important internal measurement. To obtain this diameter manually, the first and second fingers of either hand are introduced into the vagina and an attempt is made to touch the sacral promontory. The second finger on account of its greater length is usually the one which reaches

the promontory. The radial side of the first finger is now held firmly against the sub-pubic ligament, and the exact point of contact is marked by the finger-nail of the first finger of the other hand. The fingers are then withdrawn, and the distance is measured by the pelvimeter or by tape. The normal measurement is $5\frac{1}{4}$ inches.

The *true conjugate* diameter can be estimated from the diagonal conjugate by subtracting on an average 1 inch.

The amount to be subtracted depends upon the height, thickness and inclination of the symphysis and the height of the sacral promontory. To measure the true conjugate diameter directly many ingenious instruments have been devised. Two pelvimeters, namely, those of Skutsch and Farabeuf, have given practical results.

The *transverse diameter of the outlet* is obtained by pressing the palmar surfaces of the index fingers against the inner borders of the tuber ischii. An assistant measures the diameter with a pelvimeter. During labor this diameter can be estimated by pushing the half-fist between the ischial tuberosities; its normal measurement is $4\frac{1}{4}$ inches.

The *transverse diameter of the inlet* can not be measured exactly in the living subject. It is possible, however, to determine a decrease in this diameter by a comparison of the interspinous and intercrystal diameters together with the measurements between the greater trochanters and the posterior superior iliac spines. A vaginal examin-

ation will confirm the results obtained by pelvimetry. The pelvimeter of Skutsch has been employed to measure this diameter, but the results are not entirely satisfactory.

The *pubo-coccygeal diameter* is measured from the sub-pubic ligament to the tip of the coccyx. With two fingers in the vagina, the tip of the second finger is pressed firmly against the tip of the coccyx, and the radial edge of the hand is brought up firmly against the sub-pubic ligament. The point of contact is marked by a finger-nail of the other hand, and the distance is measured by the pelvimeter or tape measure. With the coccyx in its normal position this diameter measures $4\frac{1}{2}$ inches. Recession of the coccyx during labor increases this diameter to $5\frac{1}{2}$ inches. It is claimed that the Röntgen ray will detect anomalies of the pelvis, including narrowing of the inlet. The latest method of applying the X-ray for the detection of pelvic deformity consists in photographing the two halves of the pelvis separately, but on the same plate. By this method it is claimed that certain errors are eliminated and better results obtained.

Perineal Lacerations. See *Lacerations, Perineal*.

Phlebitis. Phlebitis is a variety of septic infection occurring in the uterus or in the lower extremity. In uterine phlebitis the thrombi that form in the uterine sinuses become infected and spread the infection to the uterine and other veins. In this manner secondary infections develop in the

lungs, pleura, heart, liver, the kidneys, spleen, the brain, the eyes, the articulations, the skin, and the connective tissue. Uterine phlebitis begins with a long and severe chill, followed by similar attacks at irregular intervals. During the chills the temperature rises to 104° or 106° F., the pulse is 140 to 160 per minute, and the respirations are from 36 to 56. In the interval between the chills the patient feels great relief, the temperature falling to 100° or 101° F., and the pulse and respiration in proportion. In this form of puerperal infection there is no pain, little tenderness, and no tympanites. As the disease progresses, and metastases to the various organs develop, the fever becomes continuous. The skin becomes yellowish, the nose is pinched, the eyes are sunken, the cheeks are hollow, and the tongue is dry and coated. There is complete loss of appetite, great thirst, headache, insomnia, sometimes diarrhoea, and less frequently vomiting. The urine is scanty and usually contains albumen. The *diagnosis* is based upon the symptoms, together with the negative results upon external and bimanual examination. There is no subinvolution or especial sensitiveness or exudation. *Malarial fever* may be suspected, but the chills are irregular and the fever soon becomes continuous. Examination of the blood reveals no plasmodia. The disease may be mistaken for *typhoid fever*. Typhoid is of rare occurrence in the puerperal state, and, if present, shows the well-known characteristic symptoms. Examination of the blood is of great service in the diagnosis.

The distinction between uterine *lymphangitis* and *phlebitis* is of little practical interest, and frequently the two affections are combined. The *prognosis* of uterine *phlebitis* is grave.

Treatment. The main indication for treatment apart from the general treatment for septic infection is to prevent metastasis. Absolute rest in bed best meets this indication. The slightest effort on the part of the patient may cause a chill, which indicates a secondary infection. A severe metrorrhagia may occur at times from the loosening of thrombi as a result of their suppuration. A hot intra-uterine douche of *Acetic-acid* solution, 2 to 6 per cent., is the best treatment.

Phlebitis of the leg is known as *phlegmasia alba dolens*. This condition is still called "milk-leg" by the laity. There are two varieties of this affection—the *thrombo-phlebitic* and the *cellulitic*. The first form is much more common. The condition is usually to be regarded as septic in origin, although it may be occasionally non-septic. In the phlebitic form the symptoms usually appear two or three weeks after delivery. The local affection may be preceded by anorexia, a bad taste, coated tongue, constipation and eructations. The onset of *phlegmasia* is marked by fever and possibly a slight chill. There is a feeling of weight and stiffness in the leg. Pain in the calf of the leg is often a prominent symptom. There is tenderness along the course of the femoral vein which may show a red line. The leg swells rapidly from below upward and may attain an enormous size.

The skin becomes so tense at the height of the swelling that it will not pit on pressure. In the *cellulitic* form the symptoms are similar, but the swelling is from above downward and the symptoms of pelvic cellulitis are present. Extensive suppuration may occur in this form, and the patient may succumb to exhaustion from the protracted suppuration.

Treat ment. Keep the patient perfectly quiet in bed and avoid all manipulations. Elevate the leg and wrap it in cotton. The patient should remain in bed for two weeks after the subsidence of the swelling. Painting the affected leg with Tincture of Iodine and the application of Belladonna and Mercury Ointments are recommended by leading old school authorities. Ichthyol in 25 to 50 per cent. strength is also advised. The following Homœopathic remedies will materially hasten the cure of this affection:

Apis. Fever with constant restlessness and tossing without relief; absence of thirst; scanty urine; the swelling has a whitish, transparent look. The pain is usually stinging, or there are sharp plunging pains.

Arsenicum. Great restlessness, associated with exhaustion; thirst for frequent sips of cold water; cold and chilly; wishes to be covered up warm; burning pains; swelling pale and œdematous.

Belladonna. Cutting pains as if with knives; sensation of heaviness in the thigh; the least jar of the bed is painful. Fever with burning thirst. Much moaning and restlessness. Throbbing of

the carotids; injected eyeballs; cannot bear noise or light.

Bryonia. Drawing or lancinating pains from the hip to the foot; aggravation from touch or the least motion; copious perspiration without relief; a pale pink swelling of the leg; dry lips and mouth, with desire for large quantities of cold water.

Calcarea carb. A whitish swelling of the foot and leg, with a sensation of coldness, as though covered with a cold damp cloth; suppression of milk, with a sensation of coldness all through the body. Menses have always been too frequent and too profuse.

Kali carb. Swelling of the foot and leg, with stitching and shooting pains. Stitching pains in the abdomen; abdomen distended with flatulency; distressing pain in the back, extending into the buttocks; restlessness with tossing and thirst.

Nux vomica. Red swelling of the leg with dark painful spots; a powerless, bruised sensation in the leg; a bruised, sore sensation low down in the abdomen, with frequent desire to urinate and frequent inclination to stool; loss of appetite; great depression of spirits.

Pulsatilla. Pale swelling in the foot and leg; suppression of the milk; mild, tearful, gentle disposition; a warm room aggravates all her sufferings; craves the fresh, open air; thirstless; a very offensive clammy taste in the mouth, particularly after sleeping.

Lycopodium. Swelling of the foot and limb;

the saphena vein is swollen very large and is very tender; there is much loud rumbling and moving of flatulency in the abdomen; red sand in the urine; pain in the back before urination; much restlessness at night.

Rhus tox. Marked loss of power in the leg; cannot draw it up; there is often a red streak running up the course of the saphena vein; great restlessness, relief being found for a short time after every change of position; worse after twelve o'clock at night; worse from water and wetting the part; usually wants to be covered up warm.

Sulphur. Frequent flushes of heat; weak, faint spells; short sleep, from which she starts up wide awake; little papular eruptions on the legs and over the body.

Phthisis in Pregnancy. See *Tuberculosis in Pregnancy.*

Placenta, adherent. True adherent placenta is a rare condition. Some writers believe that adherent placenta is due to chronic placentitis. Others who have carefully studied anatomical specimens prefer to regard the adhesions as the result of imperfect development, through which the villi become deeply imbedded in the muscular wall of the uterus.

Placenta, anomalies of. Anomalies in *position*, *size*, *weight*, *shape* and *number* may occur. Normally at the end of pregnancy the placenta is situated at the fundus of the uterus. It is about 1 inch thick in its central portion and about 7 inches in diameter. It weighs about one pound. The

abnormal *position* of greatest importance is placenta previa. The *size* of the placenta is variable. It may be very thin and correspondingly large. This abnormal condition is especially exhibited in the "placenta membranacea," in which the entire chorion hypertrophies, the normal atrophy of the chorion leve not occurring. The placenta may be enlarged by œdema in cases of hydramnion. The *shape* of the placenta is usually round. It may be very irregular, one or more lobes being more or less developed. It may be oval, as is quite frequent in the "battledore placenta;" or it may have a horse-shoe or crescentic shape. The anomalies of *number* are of considerable clinical importance owing to the possibility of one or more accessory growths remaining in the uterus and undergoing decomposition. When these accessory growths have a direct communication with the maternal blood, they are termed "placentæ succenturiæ." When no such communication exists, they are called "placentæ spuriaë."

Placenta, Diseases of.

I. *Interstitial hemorrhage (Apoplexy, Infarction, Hematoma, Thrombosis)*. These hemorrhages into the placental substance in the early months result from a rupture of the fragile capillaries surrounding the villi. When occurring later in the pregnancy the cause is more often thrombosis in the sinuses. The clots vary in size from that of a millet seed to that of a pigeon egg. The effused blood separates into two parts, one solid, the other liquid. The serum disappears by osmo-

sis, while the solid part contracts into a whitish, solid mass. The liquid may contain numerous white blood corpuscles, giving it the appearance of pus. Still another change is the organization of the clot, by which a distinct neoplasm is formed. The cause of these placental apoplexies is some pathological condition of the mother which leads to increased arterial tension and venous congestion. Chronic nephritis is an instance. Any additional strain causes the overtaxed venous walls to rupture. Traumatism, as a blow upon the abdomen, may produce this condition. There are no clinical symptoms which are diagnostic. If the hemorrhage is considerable there are all the phenomena of shock: feeble, small pulse, cold and clammy skin, syncope, pallor, and uterine pain. Abortion follows and the placenta shows the cause of the symptoms. If the infarcts are small and few in number, gestation continues, and the fetus suffers but little. The danger to the mother increases with the advance of pregnancy, and in the latter months may be considerable. The especial danger is accidental hemorrhage, either external or concealed. This results from partial separation of the placenta. The *treatment* in severe cases is that of abortion. If placental apoplexy is only suspected, the treatment must be symptomatic.

II. *Placentitis*. The occurrence of inflammation of the placenta is very rare. Its occasional existence, however, is admitted by the best observers. The principal objection to the recognition of the

existence of placental inflammation is the absence of capillaries and nerves in the maternal portion. The varieties of placentitis which have been described are, (1) *Acute septic placentitis*. (2) *Gonorrheal placentitis*. (3) *Emanuel's disease*. (4) *Specific placentitis*. (5) *Interstitial placentitis*. (6) *Renal or albuminuric placentitis*. The origin of placentitis is very obscure, but it is supposed to start from the decidual tissues or from the larger fetal arteries. Endometritis, either primary or secondary, is doubtless the underlying cause.

III. *Syphilis*. Syphilis of the placenta is a well-established condition. The syphilitic placenta is larger, thicker, and lighter in color than normal. Its appearance suggests that it has been soaked in water. If the fetus has been dead for some time, the placenta will be very pale in color, soft or slippery, and greasy to the touch. If the child lives till term, the placenta is unusually large and pinkish in color. Under the microscope there are characteristic changes in the villi. These characteristics do not give absolute proof, but the probability of syphilis. The condition of the child furnishes additional evidence. Syphilis of the placenta is a common cause of abortion. The fetus dies in consequence of the obliteration of the blood vessels which convey its nourishment.

IV. *Secondary alterations in the placenta*.

1. *Hyperplastic and sclerotic changes*. These changes due to proliferation of connective tissue cells with an ultimate disposition toward sclerosis

and atrophy occur in a number of primary placental diseases. A chronic placentitis is commonly present. The pathological process is similar to that which occurs in cirrhosis of the liver or in fibroid phthisis.

2. *Degenerations which follow fetal death.* The placenta as a whole undergoes marked shrinking, becoming small, thin and of a leathery hardness.

3. *White infarcts.* These are grayish-red, yellowish or pure white areas of the placenta, which replace the normal spongy, highly vascular tissues. These infarcts may become very hard from the deposition of lime salts, or they may soften secondarily and terminate in cyst formation. Small infarcts occur in a very large proportion of placentæ, and large ones are not infrequent. The simplest and most plausible explanation of their formation is the following: As a result of the hyperplastic and sclerotic changes already described the blood vessels supplying certain areas of the placenta become obliterated. The tissues thus deprived of a blood supply undergo the transformation known as coagulation-necrosis. Various retrograde changes follow as softening, canalization, cyst formation, calcification, etc. These infarcts, if large and numerous, may so diminish the area of normal placental tissue that the fetus dies from lack of nutrition, and abortion follows.

4. *Cystic degeneration.* These placental cysts result from the softening of infarcts in the majority of cases. These cysts may be so large as to simulate a second bag of waters. The cystic fluid is

usually cloudy and contains albumin. The location of these large cysts is usually beneath the chorion.

5. *Calcareous degeneration.* The deposit of lime salts upon the villi or in the substance of infarcts is by no means uncommon. The presence of these lime concretions is not of clinical importance, and has no ill effect upon the functions of the placenta. These deposits are almost always found on the uterine placental surface, in the decidua serotina, whence they may extend to the fetal portion. Chemically, these deposits consist of amorphous carbonates and phosphates of lime and magnesia.

6. *Fatty degeneration.* This frequently occurs and is usually dependent upon a previous fibrous metamorphosis. The fibrous change may occur in the villi themselves, or in the interspaces; the usual contraction, obliteration of vessels, and fatty changes following. The margin of the placenta is the region usually affected.

V. *Placental tumors.* Excluding cysts, which have already been described under degenerative changes, a number of placental tumors—about fifty—have been placed upon record. The favorite locality of these tumors is the fetal surface of the placenta near the cord. They are firmer in texture than the placenta and are separated from the placental tissue proper by a well-marked capsule. Histologically these tumors are examples of *myxoma fibrosum*. They are sometimes termed *angiomata* on account of the rich vascular supply.

None of the reported cases had any tendency to malignancy.

Præcenta Prævia. The normal implantation of the placenta is wholly within the upper uterine segment. If the placenta, in whole or in part, is implanted in that portion of the uterus which must undergo dilatation during labor, the placenta is said to be "prævia." By the lower segment of the uterus is meant that portion bounded below by the external os; its upper boundary is from $2\frac{1}{2}$ to 3 inches above, measuring along the uterine wall. Dilatation of this lower segment causes hemorrhage from separation of the placenta when placenta prævia exists. This hemorrhage is termed unavoidable in distinction from accidental hemorrhage, which has already been discussed.

Etiology. The causes of placenta prævia are not definitely known. Atrophy of the decidua, relaxation and subinvolution of the uterus, chronic endometritis, new growths and malformations of the uterus, are believed to be factors in the etiology. The fact that placenta prævia is most frequently encountered in women who have borne several children would confirm the theory that an unhealthy condition of the mucous membrane of the uterus is a strong predisposing cause.

Frequency. The frequency of placenta prævia is usually stated at about 1 in 1000 cases. If emergency and consultation cases are included, the percentage in the experience of individuals might easily rise to 1 in 250.

Structural Anomalies. The form of the placenta

is irregular; the prævial portion is less perfectly developed than the other parts of the placenta, so that the upper portion is thick while the lower portion is thin; the upper part is firmly attached, while the lower thin portion has an insecure attachment. Sometimes the placenta presents a horseshoe shape, or there may be a placenta succenturia. Adhesions between the placenta and the uterine wall are common. The insertion of the cord is rarely central.

Varieties. The best classification makes but two varieties of placenta prævia, *complete* and *lateral*. *Partial* and *marginal* are subdivisions of the lateral variety. In complete placenta prævia the placenta completely covers the internal os. In the lateral variety the great mass of the placenta is at the side of the uterus, a margin being more or less near the internal os. The lateral variety is much the more frequent.

Symptoms. Hemorrhage is the principal symptom. This hemorrhage is sudden and may vary from a few drops to a large amount. It may occur at any time during gestation from the third month to full term. Much bleeding is rare before the seventh month. The more nearly central the placenta, the earlier will be the occurrence of the hemorrhage. The hemorrhage during pregnancy is not so apt to be dangerous, but at full term at the commencement of labor the loss of blood may be so great that the patient's life is endangered within a few minutes. The loss of blood occurs in the interval between pains. The apparent increase

of the flow during a pain is due to the forcing out of blood which has accumulated during the interval. In some cases the bleeding is slight but persistent, and, if neglected, may ultimately result fatally.

Diagnosis. In the earlier months the diagnosis is impossible unless the placenta is actually palpated. Some authorities claim that the placenta can be recognized by palpation when the implantation is partly on the anterior wall of the uterus. Vaginal examination is the most reliable method of diagnosis. As placenta prævia is far more frequent in multiparæ, it is usually possible to pass the finger within the os and palpate the placenta. The cervix and vaginal fornices are softer than normal and have a boggy feel, and the presenting part is hard to reach. Ballotement is obscure or absent, and the large placental vessels and those of the lower segment pulsate distinctly. If the placenta prævia is complete nothing can be felt but placental tissue. In the lateral variety the membranes may be felt at one side and the edge of the placenta upon the other.

Prognosis. The prognosis of placenta prævia is grave in proportion to the degree to which the placenta covers the internal os. More than 50 per cent. of the children perish. If spontaneous labor occurs the fetal mortality is less. The maternal death rate varies from 25 to 33 per cent. Death results from hemorrhage and sepsis. Owing to the operative interference usually necessary there is greater risk of infection, of post partum

hemorrhage, and of thrombosis. The causes of the great maternal mortality are: (1) hemorrhage; (2) septicemia; (3) inflammations—metritis, peritonitis, phlebitis; (4) shock of version. The causes of fetal mortality are: (1) asphyxia; (2) prematurity; (3) version; (4) malpresentations; (5) inspiration pneumonia.

Treatment. When the diagnosis of placenta prævia has been definitely made, the broad rule of treatment is to empty the uterus as soon as possible. There are, however, some exceptions to this general rule. As the hemorrhage before the seventh month is rarely fatal, some practitioners advise expectant treatment in the interests of the child, until the period of viability is reached. Such a line of treatment is possibly allowable when the patient can be kept under close observation, preferably in a hospital. The great majority of physicians advise the induction of labor and the speedy emptying of the uterus as the safest method of treatment. If placenta prævia is only suspected and the hemorrhage is but slight, the treatment should be that of threatened abortion.

If the hemorrhage is so severe that special treatment is required to stop the hemorrhage, the vaginal tampon is recommended by many obstetricians. Others assert that in order to be effective the cervical canal must be included in the packing. The dilatation and packing of the cervix necessarily induces labor. Thus, labor may be induced deliberately in the treatment of placenta prævia, or it may be brought on by efforts to

check hemorrhage. If labor is to be induced the best method is the use of a solid bougie combined with gauze packing of the lower uterine segment, cervix and vagina. As soon as the cervical canal has disappeared, complete the dilatation by the bimanual method. The rubber bags of Barnes, or the balloon of Champetier de Ribes may be used to complete the dilatation, if haste is not necessary. The second stage of labor should be shortened either by forceps or version, preference being given to forceps. When dilatation of the os is complete or nearly so, and hemorrhage is copious, podalic version is the best method of treatment. Do not be in too great a hurry to extract the child after one leg has been brought down, and the hemorrhage is arrested. Give the mother a chance to recuperate before completing the delivery.

Rupture of the membranes is a useful procedure in cases of lateral placenta prævia in which the head presents. The escape of the waters allows the presenting part to descend and by its pressure check the bleeding. This method is contraindicated: (1) when the uterine contractions are vigorous, but the os is not dilated; (2) when faulty presentation exists, unless it is possible to perform immediate version. In the lateral variety the method of Barnes which consists in the separation of the placenta from the uterine wall as high up as possible is an exceedingly valuable method of treatment. This separation permits retraction of the zone uncovered, and is frequently the only treatment needed in this variety of placenta prævia.

In the treatment of placenta prævia it must be remembered that too much interference is responsible for many deaths. When the hemorrhage is under control, do not hurry the delivery. Every precaution against sepsis must be taken. Post-partum hemorrhage is of frequent occurrence, and firm retraction of the uterus must be promptly secured and carefully maintained.

Pleurisy in Pregnancy. Pleurisy with effusion is a dangerous complication of pregnancy. If the effusion becomes purulent, the danger is naturally increased. The treatment consists in the evacuation of the fluid by aspiration whenever this is possible; otherwise the treatment must be symptomatic.

Pneumonia in Pregnancy. Pneumonia during pregnancy is a serious complication for mother and child. The interference with respiration and the increased liability to heart failure are the main reasons for the severity of this complication. The degree of fever present is of great importance as regards the effect upon the fetus. More than 50 per cent. of pregnant women attacked by pneumonia abort. The percentage of premature labors increases after the sixth month. The maternal mortality of pneumonia in pregnancy is placed at 50 per cent., while the fetal mortality is estimated at 80 per cent. The treatment is the same as in the non-pregnant state. The induction of labor does not improve the prognosis. It is claimed that much benefit may be derived by allowing considerable bleeding at the time of labor in cases of pneu-

monia in pregnancy in which labor occurs spontaneously.

Pregnancy, abdominal. See *Pregnancy, extra-uterine*.

Pregnancy, Diagnosis of. The importance of a correct diagnosis in cases of suspected pregnancy is apparent. Many mistakes have been made even by experts, and it is best for the physician to be reserved in the expression of his opinion, if there is any doubt. The physician's ability to single out the important symptoms and his familiarity with all the methods of examination are the main factors in reaching a correct conclusion. The physical signs are of far more importance than the symptoms related by the patient. The first step in the diagnosis of pregnancy is to take the history from the patient's description. The second step consists in a careful examination to determine the mammary, abdominal, and pelvic changes which result from pregnancy. The symptoms obtainable from the patient are cessation of menstruation, nausea and vomiting, enlargement of the breasts and abdomen, and quickening.

1. *Suppression of Menses.* This is usually the first sign to draw attention to the condition. In a woman who has previously been perfectly regular and is in good health, the abrupt cessation of menstruation must be regarded as a strong presumptive sign of pregnancy. It must be recognized, however, that there are numerous other causes of menstrual suppression, such as anæmia, tuberculosis, syphilis, diphtheria, pneumonia,

dysentery, change of climate, exposure to cold, and mental emotions as in the so-called "psychical amenorrhœa." Another source of error is the apparent continuance of the menstrual periods during pregnancy. It is possible for a discharge more or less resembling the menstrual flow to occur up to the third month of pregnancy. Careful questioning of the patient will bring out evidence of lessened quantity, a thin or serous character, and other differences from a typical menstrual discharge. After the third month the decidua reflexa and vera coalesce, and menstruation is no longer possible. The possibility of hemorrhage from pathological conditions must always be considered. The most frequent exception to the general rule is the return of menstruation once only after conception. Under these circumstances the flow is diminished in quantity and lasts for a shorter time than usual. Again pregnancy may occur when menstruation is normally absent as during lactation. Cases are on record in which pregnancy occurred before puberty and after the climacteric. All these exceptions should be considered in estimating the value of the symptom of menstrual suppression.

2. *Nausea and Vomiting.* This symptom is frequently observed in early pregnancy. In a large percentage of cases it is comparatively mild, and does not seriously impair the health, but in a small proportion of cases it is extremely severe and threatens the life of the patient. In the milder degrees this disorder is regarded as a reflex from

the uterus acting upon the stomach through the sympathetic nervous system. In its severe form it is now regarded as one of the manifestations of the toxemia of pregnancy. In the common form this symptom begins about the fourth week and lasts until the thirteenth or fourteenth week, when it spontaneously disappears. It is most marked in first pregnancies and in women of highly nervous temperament. The value of this symptom as a sign of pregnancy depends mainly upon its association with other signs of the condition. There may be associated with the morning sickness, morbid desires, cravings for unpalatable substances, and distaste for the usual articles of diet. Other stomach disturbances, such as acidity, flatulence, heartburn, and eructations, are sometimes noticed. Salivation frequently accompanies the morning sickness. The secretion is tenacious and difficult to expectorate. This salivation may continue for months after the nausea and vomiting has subsided. Toothache is another functional disorder which may occur simultaneously with the conditions just described.

3. *Enlargement of the Breasts and Abdomen.* The patient complains of enlargement of the breasts with throbbing, tingling pains and tenderness of the nipples, and she may notice that her clothing is tighter than usual.

4. *Quickening.* The sensation experienced by the mother as the result of active movements of the fetus is known as quickening. The motion is usually first felt about the middle of pregnancy,

but may be felt as early as the third month in pregnancies after the first. Predictions of the date of confinement based upon the occurrence of quickening are very unreliable. This sign is of very doubtful value as an evidence of pregnancy. Supposed fetal movements are frequently felt by the patient, but the subsequent history of the case proves the falsity of the supposition.

Mammary Signs. The mammary signs of pregnancy include enlargement of the breasts, enlargement of the veins, changes in the primary areola, milk secretion, and the formation of the secondary areola.

1. The increased size of the breasts due to pregnancy differs from simple fat deposit in the increased firmness and knotty feeling to the touch. There is an actual hypertrophy of the glandular structures and of the connective tissue, combined with an increased deposit of fat between the lobules. The tension often stretches the skin into silvery lines similar to the striations on the abdomen.

2. *The veins* become enlarged and more visible, forming a blue tracery under the skin.

3. *The changes in the primary areola* are marked in primiparæ and furnish important evidences of pregnancy. Surrounding the nipple the areola becomes much darker in color. This is especially noticeable in brunettes. Elevation of the areola is common, especially in fair women. Enlarged sebaceous glands varying in number from two to twenty are scattered irregularly through the

primary areola. These are known as the follicles of Montgomery. These changes in the areola are well-marked by the end of the second month.

4. *Milk Secretion.* After the third month pressure upon the breast and slight stroking of the ducts running toward the areola will bring a drop or two of colostrum. This is the most important mammary sign of pregnancy in first pregnancies.

5. *Secondary Areola.* Where the primary areola fades into the skin there appears, at the fifth month, a number of light round spots, appearing as if the color had been discharged as a shower of drops. Each tiny circle has for its centre the opening of a follicle. These spots which are rarely absent constitute the secondary areola.

The value of mammary signs is greatest in primiparæ. If there is no history of long-continued pelvic disease, the mammary changes described furnish strong presumptive evidence of pregnancy. After the first pregnancy the mammary signs are of little value, and it must be remembered that various uterine and ovarian diseases, especially tumors, will produce mammary changes very similar to those occurring in pregnancy.

Abdominal Signs. The abdominal signs of pregnancy are elicited by palpation and auscultation. On palpation we may detect the progressive increase in the size of the tumor, intermittent contractions of the uterus, the fetal parts and fetal movements, and may practise abdominal ballotement. On auscultation we may hear the fetal heart-sounds and the uterine souffle.

1. *Size of Uterine Tumor and Regular Growth.*

At the end of the third month the fundus uteri is about on a level with the top of the symphysis. At the end of the fourth month the abdominal enlargement becomes noticeable, and the fundus is about two fingers breadth above the symphysis. At about the sixth calendar month (twenty-sixth week) the fundus is at the navel. The ensiform cartilage is reached by the eighth month. The fundus remains at this level for about two weeks, then sinks a trifle during the last two weeks of pregnancy. Abdominal enlargement closely simulating pregnancy occurs in so many other conditions that its presence can only be considered a doubtful sign of pregnancy.

2. *Intermittent Contractions.* As soon as the uterus has developed sufficiently to be felt by the hand through the abdominal wall, these intermittent uterine contractions may be detected. These contractions are constantly occurring throughout pregnancy at intervals of five or ten minutes. They are entirely painless. To elicit this sign of pregnancy the fundus is held firmly for from five to twenty minutes, with the patient on her back and the limbs flexed so as to relax the abdominal wall. The characteristic hardening lasting for several minutes and followed by relaxation will be felt. The cold hand will sometimes detect these contractions more readily or friction may be necessary. This sign is frequently termed "Braxton Hicks' sign of pregnancy." It has a definite value, as the disorders which likewise develop this reflex are infrequent.

3. *Fetal Parts.* The distinct recognition of fetal parts, such as the limbs, the head and the back, necessarily furnishes one of the two or three best signs of pregnancy. In cases of excess of liquor amnii or tense uterine walls from other causes it may be impossible to outline the child. Fetal parts may be detected in the sixth month or a little earlier.

4. *Fetal Movements.* The positive detection of fetal movements is a reliable sign of pregnancy of the highest importance. It may be simulated by rumbling of gas in the bowel or by localized contractions of the abdominal muscles. In examining for fetal movements, the palm of the hand is placed upon the abdomen, and steady downward pressure is kept up for some moments. Should the movements not be felt, a series of gentle taps with the free hand will usually elicit them. These movements may be detected by the sixth month, or in some cases earlier.

5. *Abdominal Ballottement.* This sign of pregnancy is elicited by placing a hand on either side of the fundus, the operator facing the mother's face. By a series of gentle but decided pushes or taps, the fetus may be passed back and forth between the two hands. This sign can not be obtained as a rule before the sixth month. It requires the presence of abundant liquor amnii and is obscured when the abdominal wall is tense or loaded with fat.

The abdominal signs of pregnancy obtainable by auscultation are the fetal heart-sounds, uterine and umbilical murmurs, and fetal shock.

1. *Fetal Heart.* The sound is generally double, and the rate is between 120 and 150. It is often compared to the ticking of a watch heard through a pillow. Sex can not be determined by the rate, although it is usually higher in small than in large children. A temporary variation in the frequency and force of the fetal heart-beats is very common. When examining for the fetal heart, the room should be quiet, the patient in the dorsal position, with the head on a pillow and the thighs flexed lightly on the body or extended. The stethoscope is usually employed, although many practitioners prefer direct auscultation by the ear. A single unstarched thickness of linen is not a hindrance to auscultation as a rule. The heart-sounds are heard most commonly on the left side of the abdomen between the umbilicus and the anterior superior spine of the ilium. The back of the child is directed to this side in the left occipito-anterior position of the vertex. The sounds are heard below the umbilicus in vertex presentations, because the head sinks into the pelvic brim. If the sounds are not detected upon the left side, search should be made in the corresponding position on the right side. If the presentation is a breech the heart-sounds will be heard late in pregnancy at the level of the umbilicus or a little above. The date at which the heart may first be heard is a little after mid-pregnancy. Skilled observers claim to have detected it as early as the fifteenth or sixteenth week. This sign of pregnancy, if clearly recognized, is a positive sign of preg-

nancy. The chief fallacy lies in mistaking for it the aortic pulsation transmitted through the uterus, or the sound of the maternal heart. The heart-beats are rendered faint or inaudible by occipito-posterior positions, excess of fat in the abdominal wall, anterior attachment of the placenta, excess of liquor amnii, by loudness of the uterine souffle, or persistent noise of gas in the bowels. The only other sign of pregnancy of equal value is recognition of the fetus by abdominal or vaginal palpation. Apart from the value of this sign in the diagnosis of pregnancy, the fetal heart enables us to determine the presentation and position of the fetus. By this means also we may diagnose multiple pregnancy and also whether the fetus is dead or alive. In labor a fetal heart rate persisting below 100 or near 200 is a danger signal calling for prompt interference to save the life of the child.

2. *Uterine Souffle.* A murmur synchronous with the mother's pulse is heard usually along the left side of the uterus. The source of this murmur is the rush of blood through the enlarged and tortuous uterine vessels. Hence the murmur is heard best at the sides of the uterus and especially along the left side which comes most closely in contact with the abdominal wall. The uterine murmur becomes audible during the fourth month and is first heard in the median line. Late in pregnancy it may be found all over the uterus. It varies greatly in intensity at different times and may entirely disappear only to re-appear after a

longer or shorter interval. It grows louder as pregnancy advances, and is most marked in anæmic women. As a sign of pregnancy it is not conclusive, as it is present with large uterine fibroids and in some cases with ovarian cysts, or chronic metritis.

3. *Umbilical Souffle*. The umbilical murmur is a slight blowing sound synchronous with the fetal heart and most distinctly heard in the location of the greatest intensity of the fetal heart-sounds. This murmur can be detected in about 15 per cent. of all cases of pregnancy, and is thought to be due to tension of the cord from coiling or to compression of the cord. The sound is heard more frequently when the cord is coiled about the fetus, and also when the cord is abnormally short or long.

Pelvic Signs. The chief indications of pregnancy obtainable by vaginal and bi-manual examination are: Purplish hue of vagina and cervix; softened cervix; compressible isthmus; bulging, elastic body of the uterus, and ballottement. Fetal parts may also be detected.

The method of examination is extremely important. The rectum and bladder should be empty. The vulva should be cleansed, and the examiner's hands carefully sterilized. The uterus is gently caught between the two hands and carefully examined. If it is not easy to grasp the uterus the finger tips are slipped beyond the cervix and hooked forward, lifting the uterus toward the anterior abdominal wall. The outer hand de-

presses the abdominal muscles so as to reach the posterior surface of the uterus as low down as possible. Beginning at the cervix the anterior and posterior surfaces are carefully examined for compressibility just above the cervix, for bulging of the walls, at the same time determining the consistency of the body, whether resiliency is present or not, and lastly swinging the body from side to side to appreciate breadth and the denser spot. When the fundus lies in the hollow of the sacrum, a tenaculum hooked into the cervix will draw down the uterus within reach. Rectal examination, or combined rectal and abdominal, may be necessary in certain cases. After the bi-manual examination inspection of the cervix for color-changes should be made.

Purplish Hue of the Vagina. This sign arises from the venous hypertrophy incident to pregnancy. Its presence on the anterior vaginal wall below the urinary meatus is especially characteristic. Chadwick has shown that 80 per cent. of pregnant women develop the color by the end of the third month. This sign is not positive, as pelvic inflammation and tumors may produce a similar discoloration, although rarely to the same extent as pregnancy. Jewett asserts that the cervix presents the same purplish color at an earlier period and more constantly than the vagina.

2. *Softening and Enlargement of the Cervix.* Progressive softening of the cervix from the fourth week onward is readily detected. In its early stages the feeling imparted to the examining

finger is compared to that of a piece of velvet stretched over a board. This softening extends progressively from below upward, until the whole cervix becomes soft and velvety in consistency by the end of pregnancy. A similar softening occurring from pathological causes lacks the progressive character.

3. *Early Changes in the Uterus.* These changes include: Bulging out of the body of the uterus; changes in consistency; compressibility of the isthmus (Hegar's sign); regular growth.

In the virgin uterus the anterior surface is flat or slightly arched, while the posterior surface is convex. From the fourth to the sixth week of pregnancy examination made during a contraction will detect a decided bulging of the uterine wall. This bulging or bellying of the body of the uterus is usually most marked anteriorly, but may be present in all directions. At times it feels like a rounded transverse ledge. During relaxation this alteration is not present.

The changes in the consistency of the body of the uterus produced by pregnancy are characteristic and important. All gradations of consistency may be present, depending upon the presence or absence of contractions. In a state of contraction the body of the pregnant uterus is resilient and elastic to the touch. In the absence of contraction the body may feel extremely soft, but usually has a doughy consistency. Frequently the change from this doughy consistency to the firm, yet elastic, state will occur in the course of the examination. Such a change is highly diagnostic.

The compressibility of the isthmus (Hegar's sign) is the most important sign of early pregnancy. Just above the cervix there is a striking absence of resistance when this sign is present. The fingers of the two hands almost meet as if no tissue intervened. Often the yielding sensation is partial yet unmistakable. When clearly obtained, this sign almost absolutely indicates pregnancy. It can be elicited from the sixth to the eighth week. After the third month this compressibility is lost.

The regular growth of the uterus may be determined by examinations made at intervals of three or four weeks. Increase in length up to the sixth or eighth week is difficult to recognize. Increase in thickness is more readily appreciated.

4. *Internal Ballottement*. Ballottement is most readily obtained in the latter part of the fourth month or the first part of the fifth. Before this time the fetus is too small, and after the seventh month there is too little fluid. In performing ballottement the patient should be in a reclining position, half-way between sitting and lying. One or two fingers against the anterior vaginal wall give a sudden upward thrust. The fetus is displaced upward through the liquor amnii, and then falls back upon the examining fingers. This is a positive sign of pregnancy in most cases. Other conditions which may give rise to similar sensations are an ante flexed uterus, a pedunculated cyst or fibroid, a vesical calculus with the bladder full, or a kidney floating low. In all these conditions no other signs of pregnancy will be present. Bal-

lottement is absent in multiple pregnancies and in deficiency of the liquor amnii. Shoulder and breech presentations do not, as a rule, respond to this test.

5. Fetal parts may be felt through the vaginal and uterine walls by the twentieth week; the head or breech detected by the twenty-eighth week, and reached directly through the cervix during the seventh month.

The symptoms and signs of pregnancy may be divided into positive, probable and doubtful signs.

I. *The positive signs are:* (1) Active movements of the child. (2) Vaginal and abdominal ballotement. (3) The fetal heart-sounds.

II. *The probable signs are:* (1) The progressive enlargement of the uterus and its alterations in shape. (2) The compressibility of the lower uterine segment (Hegar's sign). (3) Intermittent uterine contractions (Braxton Hick's sign). (4) Changes in the consistency of the enlarging uterus. (5) Changes in consistency and color of the vagina and cervix. (6) Uterine murmur. (7) Cessation of menses. (8) Mammary changes. (9) Pigmentation and secretion.

III. *The doubtful signs are:* (1) Changes in size and shape of the abdomen as well as striæ, pigmentation and fluctuation. (2) Reflex disturbances as nausea and vomiting, alterations in tastes and disposition. (3) Pressure and congestive signs, as irritable bladder or rectum, pain and œdema in the lower extremities. (4) Cutaneous signs as chloasma on the forehead and cheeks and dark circles under the eyes.

Pregnancy, Differential Diagnosis of.

The differential diagnosis of pregnancy in the first three months will be first considered.

Anteflexion of the uterus with atrophy of the angle and hyperæmia of the body may simulate a uterus two months pregnant. The peculiar elasticity of the pregnant uterus is not present, menstruation, even though scanty, persists, and a later examination fails to show progressive enlargement.

An interstitial fibroid in either uterine wall is dense, hard, and uneven. Menstruation is increased in amount.

An ovarian cyst imparts to the examining finger a feeling of tension and clear elasticity, which is more stable and more distinct than those of the pregnant uterus.

Chronic metritis and *sub-involution* give a feeling of firm resistance with no elasticity or doughy feel. Hegar's sign is absent as well as the globular shape and the bulging of the anterior wall.

In retroflexion the swollen uterus may resemble the gravid organ of the fifth or sixth week, but the probable signs of pregnancy are absent. After reposition of the organ and consequent shrinkage differentiation is readily made.

A study of the physical signs of the cervix and the body of the uterus as to color, size, shape, and consistency is of the utmost importance in the diagnosis of pregnancy in the first three months.

In the differential diagnosis of pregnancy in the later months, three general rules should always be remembered.

1. The rate of enlargement differs from that of the pregnant uterus.

2. The size and the period of amenorrhœa do not correspond.

3. The positive signs of pregnancy are absent. Menstruation usually persists.

With each of the following disorders it will not be necessary to repeat these statements:

Obesity shows the abdominal walls soft, doughy, and easily palpated between the fingers. There are no signs of pregnancy upon bi-manual examination, and the cervix is small and hard. Obesity is a frequent cause of amenorrhœa or scanty menstruation, and especially when anæmia co-exists.

Tympanites. Great resonance on percussion, marked variations in size on different days, and the absence of a firm tumor make the diagnosis clear. The cervix remains hard.

Ascites. In ascites fluctuation is distinct. The percussion note is resonant in front and flat or dull on the sides, the level of flatness changing with changes of posture. Suppression of the menses is often seen in cases of ascites, and cardiac, renal, or hepatic disease can usually be detected.

Ovarian Tumors. Fluctuation is present, though less distinct than in ascites. The abdominal enlargement comes on more slowly than in pregnancy, and in its earlier stage is located at one side of the median line; later it may be central, but this will be after long growth. The uterus and cervix is displaced toward the back, side or front. Menstruation is ordinarily present, and

the patient gives a history of increasing dysmenorrhœa. The possibility of the co-existence of ovarian tumor and pregnancy should always be remembered.

Fibroid Tumors. A uterine fibroid is usually hard and firm to the touch. The growth is usually nodular and not symmetrical. The rate of growth is slow, and menstruation is not only present, but is usually increased in quantity and lengthened in duration. If anæmia stops the flow, the arrest is gradual and not sudden. Unless the tumor is very large and situated low, the purplish hue of the vagina and cervix is not developed as in pregnancy.

Enlarged Abdominal Organs. These develop from above downward. Wandering organs like the kidney and spleen can be pushed upward. Malignant growths are lumpy and fixed, and cachexia is present.

A *distended bladder* is of comparatively short duration, is attended with much discomfort and dribbling of urine. The catheter settles the diagnosis.

Pseudo-cyesis, or false pregnancy, usually occurs near the menopause. A bi-manual examination discloses a small, hard uterus, while the administration of chloroform causes the disappearance of the phantom tumor.

Hematometra, or the enlargement of the uterus from retained menses, is exceedingly rare and results from an atresia somewhere between the cervix and the hymen. This atresia is usually

congenital, but may result from disease. A physical examination will disclose the true condition of affairs, while the history will disclose a slowly developing tumor with sudden and periodic enlargement, followed by slight decrease in size.

Pregnancy, the Duration of. The normal duration of pregnancy is nine calendar months, or about ten lunar months. There is an element of uncertainty in the determination of the exact duration of pregnancy in any particular case, since the date of conception is always unknown. Conception may result from the union of an ovum liberated at the commencement of menstruation with the spermatozoa introduced toward the end of the period; or it may result from the meeting of the male elements already within the oviduct with an ovum discharged a day or two before the occurrence of menstruation. It is generally believed that the most favorable time for fertilization is the period immediately following menstruation, and predictions of the date of labor based upon this theory have proved the most reliable. The rule of calculation is as follows: Determine the exact day at which the last menstruation appeared. Count forward nine months, or count backward three months, and add seven days. It is quite possible for gestation to be prolonged beyond the normal period. Many cases are on record in which pregnancy has been prolonged far beyond the usual time, and the courts are, at times, called upon to decide the legitimacy of the child. Laws on this question vary in different

countries. The maximum duration is three hundred and four days.

Pregnancy, Extra-uterine. Extra-uterine pregnancy, or ectopic gestation, consists in the development of the fertilized ovum in any part of the generative tract outside of the cavity of the uterus.

Varieties. The *primary* varieties are tubal, ovarian and abdominal. The cases of primary ovarian and abdominal pregnancy are so rare and so difficult of actual demonstration that, practically, tubal pregnancy is the only primary form. Tubal pregnancies are divided into three varieties: (1) interstitial; (2) true tubal, isthmial or ampullar; (3) infundibular or tubo-ovarian.

An interstitial tubal pregnancy is one in which the ovum develops in that portion of the tube which passes through the uterine wall.

A true tubal pregnancy implies the development of the ovum in the free portion of the tube. When it occurs in the inner portion of the tube, it is termed *isthmial*, and in the outer, *ampullar*. The infundibular variety denotes an extra-uterine pregnancy in which the ovum lodges and is developed in the infundibulum of the tube. When the ovum is attached to the surface of the ovary the term tubo-ovarian is used.

Cornual pregnancy occurs when the ovum develops in the supplementary horn of a bi-lobed uterus. Although this condition in its course and termination resembles extra-uterine pregnancy, it can not properly be classed as a variety of the

latter, as it is strictly a uterine pregnancy in an abnormally formed uterus.

The *secondary* varieties of extra-uterine pregnancy are derived from the primary, and are classified according to the position which the ovum and its membranes occupy after the rupture of the tube. No useful purpose can be served in attempting to classify these secondary forms.

Etiology. No theory of causation is entirely satisfactory. In a general way any condition which prevents the passage of the ovum to the uterus, but which does not prevent the passage of the spermatozoa to the ovum, may cause extra-uterine gestation. Diseases of the tubes and malformations of the tubes are the main causative factors. It is well known that extra-uterine pregnancy occurs most frequently in multiparæ, and seldom under thirty years of age. A large proportion of cases occur in women, who are either sterile or have not been pregnant in a long time. Inflammatory conditions of the tube which destroy the cilia and produce atresia; pressure on the tube by an abdominal growth, or peritoneal adhesions from an old inflammation; congenital deviations from the normal, such as exaggerated convolutions and diverticula—all these conditions are possible causes of extra-uterine gestation.

Pathology. In the *tubal* variety the ovum develops usually at the junction of the middle and outer thirds. The tube begins to thicken in the first week, but this thickening is due chiefly to the increased blood supply and not to hypertrophy of

the muscular fibres. As the ovum grows, it meets with resistance from the walls of the tube. The walls stretch to accommodate the growing embryo, but do not stretch equally in all parts. Here and there the wall of the tube is thinner, and it is at one of these places that rupture occurs. The ovum is surrounded by amnion and chorion as in normal pregnancy, and there is a true decidua analogous to the decidua vera. As regards the placenta, it may be stated that its formation depends upon the amount of decidual formation. The small amount of space available necessarily limits the formation of the placenta to a marked degree. Closure of the ostium abdominale usually occurs by the seventh week. If the ovum is retained in the ampullar extremity of the tube complete closure does not occur, and there is a constant tendency to tubal abortion. Until the fetal membranes are well formed the detachment of the ovum from the wall of the tube is comparatively easy. Such a termination is most favorable from the first to the third week of the pregnancy. The ovum thus detached has the appearance of a blood clot, and, unless carefully examined, its true character may be overlooked. It is called a tubal mole, and careful examination will always detect the chorionic villi. When the detached ovum is extruded through a patent ostium abdominale into the abdominal cavity, a tubal abortion has occurred.

In a tubal pregnancy the ovum may grow upward or downward. If it grows upward, early

rupture is the rule. If rupture does not occur, continued growth results in the formation of a pedunculated tumor attached to the uterus. If the growth is downward, separating the folds of the broad ligament, rupture may not occur as the broad ligament gives considerable support. The growth fills the pelvic cavity and constitutes the intraligamentous form.

In the *interstitial* variety there is little room for growth. Rupture is almost inevitable, but is not so early as in the tubal variety. Occasionally the growth is toward the uterine cavity, and after rupture the fetus is expelled into the uterus and escapes by the natural channel. The symptoms then are those of an ordinary abortion. Usually rupture occurs into the abdominal cavity, and the hemorrhage is so profuse that the patient succumbs.

The changes in the uterus in cases of extra-uterine pregnancy are interesting. The uterus enlarges, and a decidua vera is formed. This decidua is usually thrown off about the time of the primary tubal rupture. The persistence of life in the ovum after rupture of the tube does not prevent the shedding of the decidua. The decidua varies in thickness from one-eighth to one-quarter of an inch.

Clinical History and Terminations.

Extra-uterine pregnancy when it does not terminate fatally is liable to leave the patient in a crippled condition. The shock and hemorrhage occurring with the rupture of the fetal sac enfeeble

the woman. There may follow ulceration, with abscess formation; the abdominal walls, bladder, and intestines may be perforated by the bony portions of the fetus; obstruction of the bowel may occur as the result of adhesions. The duration of an extra-uterine pregnancy depends mainly upon the degree of distensibility of the surrounding structures. Rupture occurs when the limit of distensibility is reached. Rupture is sudden and either spontaneous or caused by some slight traumatism. Sudden, sharp pains radiate over the abdomen, which becomes extremely sensitive. The pulse at first rapid soon becomes almost imperceptible. The face is pale; there exists "air hunger," with audible yawning. Vertigo, nausea and vomiting may be present. The symptoms of profound shock, such as cold, clammy extremities, pale skin, pearly conjunctivæ, and drawn look about the mouth soon appear. The mind is clear. Death may ensue speedily, or the patient may rally for a time and apparently improve. After a few hours or in some cases a few days, the symptoms recur, and death comes quickly. If the hemorrhage is extra-peritoneal into the broad ligament, the symptoms may not be so urgent. The blood as it accumulates stops the hemorrhage by its own pressure. If the embryo dies at the time of rupture under these conditions, there is no further trouble. Unfortunately in many cases the fetus continues to develop and sooner or later a secondary rupture occurs. In the rare cases which go on to full term, false labor occurs, and is accompanied by uterine

contractions and a bloody discharge from the uterus. The cervix relaxes and may admit two fingers. This false labor may last from eight hours to a week, and ends with the expulsion of a decidua. The fetus generally dies and is retained. The retained fetus may undergo fatty degeneration, mummification, or calcification.

Symptomatology and Diagnosis. The symptoms common to all forms of extra-uterine pregnancy are: suppression of the menses; increase in size of the abdomen and of the breasts; digestive and sympathetic disturbances; reflex nausea and vomiting commonly severe and beginning early. The suppression of menstruation is subject to the greatest variations. In some cases amenorrhea is constant. In many cases there are irregular discharges of blood from the uterus accompanied by expulsion of the decidua. The decidua is usually expelled in small pieces, but occasionally a complete cast of the lining of the uterus comes away. Pain more or less persistent is a common symptom. To be diagnostic of extra-uterine pregnancy the pain should be sharp, colicky in character, distinctly located on one side, attended with faintness, and followed by hours or days of complete remission. Excruciating pain with syncope points to serious rupture. If tubal pregnancy could be diagnosed before rupture, the prognosis would be far better than at present. If a case presents all the evidences of early pregnancy, and in addition there are irregular, bloody discharges, perhaps containing membranous shreds, and ab-

dominal pain is present, the existence of extra-uterine pregnancy should be strongly suspected. Whenever there is any doubt as to the diagnosis it is now considered perfectly proper and advisable to open the posterior vaginal cul-de-sac and make a digital examination of the suspected tumor. The physical signs of extra-uterine pregnancy are as follows: The existence of two neighboring tumors, one situated to the right or to the left of the median line and slightly movable; the other in the median line, more regular, and giving contractions. The latter is, of course, the hypertrophied uterus. The cervix uteri is soft and elevated. The uterus is usually in front of the fetal tumor. Sometimes the uterus forms one body with the other tumor. From the fourth month the uterine tumor remains stationary in size; the fetal cyst continues to enlarge and forms an irregular mass deviating to one side, with the long axis transverse. Active movements of the fetus and fetal heart sounds can be perceived from the fifth month.

Differential Diagnosis. The diagnosis in the first three months is always difficult. A strong probability of the existence of tubal pregnancy justifies surgical interference. Some of the conditions which require differentiation are ovarian cysts, fibromata, salpingitis (especially hemato-salpinx) and hemocele. Displacements of the uterus often confuse the diagnosis. An adherent retroverted gravid uterus may cause error. A pregnant double uterus with retroversion is very difficult to differentiate. Pregnancy occurring in the rudi-

mentary horn of a bi-lobed uterus presents physical signs almost identical with those of a tubal pregnancy. The relationship between the tumor and the round ligament helps in the diagnosis. If the pregnancy is tubal, the ligament will be connected with the uterus on the inner or uterine side of the cyst. If the pregnancy is in a rudimentary cornu of the uterus the round ligament will be external to the gestation-sac. After the fourth month, if the fetus survives, the diagnosis is easier. The fact of pregnancy is known. The fetus is more superficial in extra-uterine pregnancy. The diagnosis of ectopic gestation after the death of the fetus depends mainly upon the clinical history; if this is deficient, the diagnosis is frequently impossible.

Prognosis. For the child the prognosis is usually fatal. A number of cases have been reported in which the child was living when extracted. The child is often deformed, club-foot being especially common. For the mother the prognosis is very grave. The mortality is about 50 per cent.

Treatment. Surgical treatment is the only treatment of value. From the operative standpoint, we may divide extra-uterine pregnancy into the following periods: 1, before rupture; 2, at the time of rupture; 3, after rupture; 4, after the occurrence of degenerative changes in the retained fetus. If ectopic pregnancy can be surely diagnosed before rupture, laparotomy is the best method of treatment. Cases with a history suggestive of ectopic pregnancy, and presenting a mass lateral

to the uterus upon vaginal examination should be operated upon without hesitation. Some of these cases may prove to be pyo-salpinx or hydro-salpinx, but no serious harm will result.

The treatment at the time of rupture calls for the exercise of considerable judgment on the part of the surgeon. If the patient is in collapse, an examination should be made to determine, if possible, whether rupture has occurred into the broad ligament or into the abdominal cavity. If the rupture is intra-peritoneal, an immediate operation offers the only hope. In the case of extra-peritoneal rupture the conditions are not so urgent, and, if the patient recovers from the shock, it is better not to interfere at all until later. The vaginal route is preferred by operators of large experience when the time comes to operate upon a case of this kind.

When a patient does not come under observation until a considerable time has elapsed since the rupture, either she is convalescent or is suffering from complications. These complications are as a rule the results of sepsis. Usually the sepsis is local, involving at first only the gestation-sac and the affected tube and the blood-clots resulting from the hemorrhage. If suppuration occurs, adjoining organs may become involved, and pelvic abscess result. If suppuration does not occur, the inflammatory process binds together the affected parts and the adjoining organs by a net-work of fibrinous adhesions. In all these septic cases, if the mass is situated well down in the pelvis,

vaginal incision with drainage is the best method of treatment.

When the fetus has undergone mummification, calcification, or saponification, there is no occasion for operative interference, if the patient's health remains good. Any constitutional disturbance, especially if febrile in character, calls for the removal of the foreign body. If suppuration occurs with the production of fistulous passages into the bladder, the rectum, the vagina, or externally through the abdominal wall, the fistula should be dilated and the fetal remains extracted. Frequent irrigation may effect the closure of these sinuses, or they may be persistent.

While the great majority of extra-uterine pregnancies terminate by the death of the fetus at the time of primary rupture, there are not a few instances in which the fetus lives and continues to grow after primary rupture of the gestation sac. When an ectopic gestation has advanced well into and beyond the fifth month the proper treatment of the case requires very careful consideration. While consideration should be paid to the child, the mother's life must not be endangered by attempting to save the child. If the woman's health has been so seriously affected by repeated attacks of circumscribed peritonitis, recurrent hemorrhages moderate in amount, and excessive pain, that she can not endure an operation, the child should be killed by the injection of morphia into the sac. After the death of the child the placental souffle will disappear, the pain will subside, a con-

siderable portion of the liquor amnii will be absorbed, and in three or four weeks an operation can be performed with fair chance of success. With a woman in good condition, and with the placenta apparently in a position where it may be easily avoided, an attempt may be made to save the life of the child. In all cases of advanced ectopic pregnancy in which the child is alive, abdominal section is the best method to adopt. The incision need not be in the median line. The position of the placenta determines the site of the incision. If the fetus is in the unruptured tube, the incision is made over the most prominent protuberance of the tumor, usually near the median line and low down. Every care should be taken to avoid the placental site. The important point is the management of the placenta. If its attachments are so numerous and deep-seated that severe hemorrhage will follow its immediate removal, the placenta should be left in place to come away piecemeal. The edges of the incision in the sac should be sewed to the edges of the abdominal wound and the cavity packed with gauze. If the fetus is in the abdominal cavity, the abdomen is opened, a place is found where the vessels are least numerous, the sac is opened at this point and the child extracted. No attempt should be made to remove the placenta. The sac is carefully packed with gauze, and the edges of the sac attached, if possible, to the edges of the abdominal wound.

Pregnancy, Multiple. Multiple pregnancy

may be defined as the development of two or more embryos within the maternal organism at the same time. Multiple conception may result in the birth of twins, triplets, and very rarely quadruplets. There are several authentic instances of five children at one time, and at least one apparently trustworthy case of the birth of six. Twins occur once in about ninety cases; triplets, once in eight thousand; quadruplets, once in four hundred thousand. The most important factor in the causation of multiple pregnancy is heredity. This influence manifests itself more particularly upon the maternal side. Multiple pregnancy may arise from one or more ova in a single uterus, from two or more ova impregnated in a double uterus, or from one ovum or more in the uterus and one extra-uterine. In this connection it is necessary to define the terms *superimpregnation*, *superfecundation*, and *superfetation*.

Superimpregnation means the impregnation of two or more ova at the same coitus. *Superfecundation* means the impregnation of one or more ova after one has already been impregnated. *Superfetation* means the impregnation of an ovum when an embryo already occupies the uterus. Two results may follow superfetation: (1) Two children are born at the same time, but different in development; or (2) two children are born at different times, equally developed. That superfecundation may occur in both women and the lower animals is a matter of certainty. Superfetation is considered impossible by most authorities, but

there are some cases on record which are hard to explain by any other hypothesis. The occurrence of multiple pregnancies is usually explained by the assumption that two Graafian follicles mature at the same time, rupture and discharge their ova, which are impregnated at the same time. As a rule, twins develop from two distinct ova which are derived from the same or different Graafian follicles. They may be situated in different ovaries. Twins, therefore, may be derived from one ovum from each ovary, from two ova from one ovary, or from a double ovum, both nuclei being fertilized. Twins originating from a single ovum are always of the same sex. The arrangement of the fetal membranes in cases of multiple pregnancy is interesting. The decidua vera is invariably single; the decidua reflexa is double when the ova become attached to widely separated parts of the uterine wall. The chorion is single when the twins originate from a single ovum, but double when they arise from two ova. Originally the amnion is always double. When twins are in one common membrane at birth, there has been an absorption of the septum which originally existed. The placenta is primarily double, for each fetus produces its own allantois. The close proximity of the placentæ usually leads to fusion of their edges with deep and superficial anastomoses of the blood vessels. Whenever two chorions are developed anastomosis of the placental vessels does not occur. The anastomoses of the placental vessels may exert a very strong influence on the

development of the twins. Circulation from the weaker may be directed almost entirely to the stronger, and as a result fetal atrophy and acardia may result. In case of the death of one fetus, the living child in its growth gradually reduces the mass of the dead product of conception until it becomes a flattened mass pressed against one side of the uterine wall, and known as the "*fetus papyraceus*." There may be a striking difference between the infants at birth, the one large and vigorous, the other small and puny. Occasionally the larger child may be born at term, while the imperfectly developed twin is retained for a time in the uterus until it has developed more perfectly, when it in turn is born. Two remarkable cases in which double uteri were present have been recorded, where intervals of forty-three and thirty days, respectively, intervened between the births of the two fetuses.

Triplets may originate from one, two, or three ova. A common method is for one child to be derived from a distinct ovum, while the other two are derived from another single ovum.

Quadruplets may consist of double twins, or of triplets together with a single child.

Symptoms and Diagnosis. Excessive size and tension of the abdomen are significant of twins. Permanent uterine tension with very limited mobility suggests multiple pregnancy. Persistent tension is also a symptom of hydramnios, but in this condition excessive mobility of the fetus is present. The concealed form of accidental hemor-

rhage also gives increased tension, but the symptoms of internal hemorrhage are prominent. The abdominal tumor is usually broader in multiple fetation. Detection by abdominal palpation of two fetal heads, or of two dorsal planes, of three or four fetal poles, or of a multitude of small parts, are positive signs of twins. If the distance from the pelvic pole to the fundal pole is more than 30.5 cm., 12 inches, twins may be diagnosed. The recognition of two fetal heart-sounds at different points of the abdomen, and of different rates, is considered a positive sign of twin pregnancy. The detection, by bimanual palpation, of two fetal poles in the uterus is probably the most reliable sign. Upon pushing upward with the fingers in the vagina, the hand upon the fundus will perceive an absence of motion in one pole, and the conveyed impulse of the vaginal palpation in the other.

Prognosis. The mother is more liable to toxemia of pregnancy and eclampsia on account of the increased metabolism of the two fetuses, and the greater pressure on the kidneys and the ureters. Uterine inertia, prolonged labor, and post-partum hemorrhage may occur as a result of the extreme uterine distention.

Premature expulsion of the fetuses occurs in about 25 per cent. of all cases with greater tendency to the retention of the placenta.

Phenomena of Labor. Twin labors are usually easy and uncomplicated, but complications are more frequent than in single labor. In the major-

ity of cases the interval between the delivery of twins is less than one hour. A longer delay than this indicates either some obstruction to the birth of the second child or a failure of expulsive forces. The fetal presentations run as follows in twin labors: The commonest form is the double vertex (about 50 per cent.); next, the fetus to be born first presents by the head, the other by the breech (about 30 per cent.); third, both present by the breech (about 9 per cent.); fourth, a head and a shoulder presentation are associated (about 6 per cent.); fifth, a breech and a shoulder present (about 4 per cent.). Two shoulder presentations occur very infrequently. In regard to abnormal presentations in twin pregnancy, bregma, brow, and face presentations occur more frequently than in single births. Brow and face presentations, as a rule, terminate more favorably than in single labors.

Management of Twin Labors. After the birth of the first child the cord must be tied in two places, lest there should be communication between the placental circulations and the second child should bleed to death. After the first child has been delivered, a careful abdominal and vaginal examination should be made. If the second child does not present by the shoulder there should be no intervention, since in most cases the delivery of the second child is easy, and because the rapid emptying of the uterus is inadvisable owing to the danger of post-partum hemorrhage. If the second fetus is found in a shoulder

presentation, cephalic or podalic version should be performed, and extraction effected immediately. It may be possible to turn the child by external manipulations, or by the combined method, and this should be attempted before resorting to internal version. While the second child is being born a hand should be kept on the abdomen, following the uterus down as it retracts. As a rule, all the secundines are expelled after the birth of the second child. If there should be partial separation of the placenta and hemorrhage, the uterus should be emptied artificially. In rare cases both placentaë are expelled before the birth of the second child, which must then be delivered at once to avoid suffocation. In case of twins originating from a single ovum there is one placenta only, and the two umbilical cords may become so twisted and entangled as to retard the delivery of the placenta.

Complex Cases of Multiple Pregnancy.

Two types of complications may arise in multiple pregnancy. These are termed respectively *multiple presentation* and *interlocking twins*.

In multiple presentation parts from both fetuses are found at the pelvic brim. Labor is retarded by the fact that neither part is able to pass the brim. In the case of two heads, or a head and a breech, the hand in the vagina should endeavor to push one of the presenting parts upward and out of the way. Some authorities advise engagement of the lower head with the forceps to prevent a return of the complication. Sometimes labor may

be delayed by the presence in the dilating cervix of two bags of water. When dilatation is complete the bag of the leading child should be ruptured.

Interlocking twins may occur in several ways. When the heads are unusually small the second may enter the pelvis after the first and jam against the neck or thorax. The treatment is to deliver the most advanced head with forceps, and then to extract the other. If the locking cannot be overcome, perform craniotomy upon the first fetus. The second child has the advantage over the first, in that the cord is in less danger of compression. Twins may become locked when the first child presents by the breech and the second by the head. If the fetuses are face to face, which is the usual relation, the chins may become locked; if back to back, the occiputs; and if the back of one is to the face of the other, the locking occurs between the chin and the occiput. The first step in the treatment is to attempt to push the head of the second fetus up out of the pelvis. If this is impossible and nature does not soon bring about delivery, the forceps should be applied to the head of the second child. If delivery is still impossible, the child presenting by the breech will almost surely have died and there will be no pulsation in its cord. The head of this child should be perforated and the child extracted in an attempt to save its fellow. After the extraction of the mutilated child the other can easily be delivered with forceps.

Pregnancy, Physiology of.

The whole maternal organism shows marked

changes as a result of pregnancy. The genital region naturally is most affected.

The uterus is the seat of the principal alterations. The size, shape, structure, position, and properties of the uterus are all affected. The virgin uterus measures $2\frac{3}{4}$ inches in length, $1\frac{3}{4}$ inches in breadth, and 1 inch in thickness, and weighs about one and one-half ounces. At term the uterus measures about 14 inches in length, about 10 inches in breath, about $9\frac{1}{2}$ inches in thickness, and weighs about two pounds. It increases, therefore, in size about twenty-five times. In capacity it increases from one cubic inch to four hundred cubic inches.

The uterus retains its pyriform shape during the first three months of pregnancy, although by the eighth week there is marked bulging of the anterior and posterior walls so that it resembles an old-fashioned jug inverted. During the fourth and fifth months the organ becomes more nearly spherical in shape, while in the later months it again resumes its ovoid shape, although flattened in its antero-posterior diameter by the pressure of the abdominal walls.

The structure of the uterus exhibits marked changes in pregnancy. The muscular elements become enormously hypertrophied. Three well-defined layers of muscular tissue exist in advanced pregnancy. The external layer is thin and closely adherent to the peritoneum. The middle layer is thicker than the other two layers combined, and is composed of circular fibres surrounding the blood

vessels and of longitudinal fibres interlacing with one another. The inner layer consists mainly of circular fibres surrounding the orifices of the tubes and the os internum. The arteries are greatly increased in size and length, and become extremely tortuous. At the placental site the arteries terminate in the curling arteries of the uterine decidua and empty directly into the placental sinuses. The veins dilate into large sinuses, which are especially prominent in the placental area. The lymphatics, starting from lymph channels just beneath the mucous membrane, form large lymphatic vessels which traverse the muscular layers and terminate in extensive lymphatic plexuses over the fundus and sides of the uterus.

The nerves also increase in length and thickness. The cervical ganglion is more than doubled in size, and smaller ganglia become visible on the inner surface of the uterus.

This increase in size of the uterus is at first symmetrical, but later the fundus grows more rapidly than the cervix. The walls of the uterus become thickened, so that in the middle of pregnancy they measure about five-eighths of an inch. During the latter months, on account of distention, the walls are thinned to three-sixteenths of an inch.

The position of the uterus varies from time to time as pregnancy advances. During the first and second months the increased weight of the uterus causes it to sink a little into the pelvic cavity. During the third month the fundus rises and at the same time falls forward, thus increasing the normal

anteversion of the uterus. In the early part of the fourth month the uterus begins to rise above the pelvic brim, and this upward enlargement continues progressively until at about eight and a half months the fundus is nearly in contact with the ensiform cartilage. During the last two weeks of pregnancy the uterus sinks more deeply into the pelvic cavity so that the fundus is from $2\frac{3}{4}$ to 3 inches below the ensiform cartilage. This sinking of the uterus is termed lightening and is more noticeable in primiparæ on account of the greater rigidity of the abdominal walls. In consequence of the position of the sigmoid flexure and rectum, usually distended as a result of constipation, the uterus is tilted to the right side and is rotated on its longitudinal axis. Hence the left broad ligament and the left ovary become more accessible to palpation. The intestines normally are situated above and behind the uterus, thus giving no resonance over the anterior abdominal wall on percussion.

The new properties acquired by the uterus in consequence of pregnancy include the yielding and elastic nature of the muscular walls, increased irritability as evidenced by the response of the muscular fibres to stimulation, and the regular painless contractions, beginning at an early period in the pregnancy and becoming more and more marked as full term approaches.

The Cervix. The cervix participates to a certain extent in the general hypertrophy of the uterus so that by the end of the third month the cervix has

a length of about 2 inches. It retains this length until about two weeks before labor, when an apparent shortening occurs owing to the expansion of the internal os preparatory to the onset of labor. From the time of conception, softening of the cervix begins at the external os, and gradually extends upward until the whole cervix is involved. The glands of the cervix secrete a tough mucus, which forms the so-called "mucous plug." In the first three months of pregnancy the cervix is lower in the pelvis and a trifle to the left. After the third month the cervix rises higher in the pelvis till the last two or three weeks of gestation, when it sinks again. The direction of the cervix changes according to the movements of the uterine body.

The Peritoneum. The peritoneum at the end of pregnancy, before the sinking of the uterus, is elevated to such an extent that the anterior fossæ are nearly obliterated. The broad ligaments are drawn upward, so that at full term the bases of the ligaments lie on a level with the pelvic brim. The folds of the ligaments gradually become separated, and at the end of pregnancy the ovaries and fallopian tubes are in close contact with the uterus. The utero-sacral ligaments at term are attached to the first, instead of the third or fourth, sacral vertebra. The round ligaments are drawn up above the pelvic brim, and their course at term is from the umbilicus obliquely downward and outward to the inguinal ring. The left round ligament is especially prominent, owing to the axial rotation of the uterus.

The vagina shares in the general hypertrophy which affects the whole generative system. The muscular and mucous walls are thickened and lengthened. The venous plexuses surrounding the vagina are greatly developed. As a result of arterial hyperæmia and passive congestion, the mucous membrane acquires a bluish-red hue, which has been compared to the color of wine-lees. The enlargement of the mucous membrane causes it to be thrown into folds, and the anterior wall frequently protrudes from the vulva as a violet-colored swelling. There is an increased secretion from the mucous glands, and the swollen papillæ impart a granular feel to the examining finger. The temperature of the vagina is slightly increased, and the augmented blood supply causes a distinct throbbing of the vaginal arteries.

The external genitals share in the general hypertrophy. The labia majora and minora increase in size, the veins become varicose, and there is greatly increased functional activity on the part of the sweat-glands and sebaceous follicles. The vulva assumes a dusky hue and becomes more prominent.

The pelvic articulations are softened to a certain extent by the increased vascularity of the inter-articular cartilages. The pelvic ligaments are also softened, and the synovial membranes are increased in size. As a result of these changes, there is a limited amount of motion at some of the pelvic joints. The symphysis pubis is the articulation most affected. These changes in the articula-

tions may become so pronounced as to seriously interfere with locomotion, but this is rare. The sacro-coccygeal articulation is normally mobile in all women during the first fifteen years of the child-bearing period, and the bending back of the coccyx materially increases the antero-posterior diameter of the pelvic outlet.

The Abdominal Walls. Important changes occur in the abdominal walls during pregnancy. In many cases there is a physiological diastasis of the recti muscles. This diastasis becomes very palpable when the placenta is expressed by the Credé method. At times the separation of the recti muscles measures several centimeters. Under favorable conditions this diastasis disappears, and the other abdominal muscles regain their normal tone within the first two or three weeks of the puerperium. In other cases, owing to original defective development of the abdominal muscles, lack of care during the puerperium, or frequently recurring pregnancies, the diastasis and changes due to pressure-atrophy may persist through life. The insertions of the abdominal muscles into the lower borders of the cartilages of the ribs are rendered tense by the growth of the uterus and give rise at times to considerable pain. This pain is usually most severe on the right side on account of the lateral torsion of the uterus.

The Bladder and Rectum. The growth of the pregnant uterus mechanically interferes with the functions of the bladder and the rectum, hence irritability of the bladder and constipation are com-

mon complaints. Hemorrhoids of the anus and rectum are often observed, especially toward the end of pregnancy.

The Breasts. The changes in the mammary glands relate to size, structure, consistence, and function. The enlargement of the breasts begins as early as the second month, but it does not become very noticeable until toward the middle of pregnancy. Complete development of the mammary gland does not occur until pregnancy ensues. The development starts from the periphery and progresses toward the centre, and does not affect the organ symmetrically. On palpation uneven and knotty masses may be felt especially in the periphery. These masses and cords are the enlarged acini and lobules of the rapid-growing glandular tissue imbedded within the areolar and adipose tissue. The sensibility of the breasts is increased, and shooting pains radiating toward the axillæ are not uncommon. The superficial veins are enlarged and more distinct, and reddish, bluish, or whitish striæ appear as manifestations of the unusual tension of the integument. The areolæ increase in size, pigmentation is more marked, and the sebaceous glands, the glands of Montgomery, become enlarged and prominent. The nipples increase in size and are more erectile and more sensitive. After the third month the breasts contain a thin fluid, the colostrum, which may be expressed by manipulation of the breast.

General Changes. Pregnancy is the cause of numerous and important changes in the maternal

organism. These changes affect the nervous and circulatory systems more than other parts of the body. The pregnant woman breathes, provides nourishment, secretes and excretes, not only for herself but for the growing fetus as well. The normal woman under normal conditions performs this double task without any difficulty, but the border line between physiology and pathology is a narrow one and easily traversed.

Circulatory Changes. The blood is somewhat altered in composition and increased in quantity. The white blood corpuscles are slightly increased. The red blood corpuscles are not much affected under normal conditions. Albumin is diminished, while fibrin and extractive matters are decidedly increased. Diet and hygienic surroundings play a very important part in maintaining a normal condition of the blood during pregnancy. It is probably true that anæmia rather than plethora is the more common state.

It is usually stated that the heart hypertrophies during pregnancy, the hypertrophy affecting the left ventricle only. Recent investigations appear to demonstrate that there is no actual hypertrophy, but that the growth of the fetus, by pressing upon the diaphragm, forces the apex of the heart upward and outward, and that this dislocation has been falsely interpreted as hypertrophy. No constant changes in blood pressure have been demonstrated. The spleen and the liver are increased in size. The enlargement of the spleen is probably due to the quantitative change in the

blood. Fatty degeneration occurs in both liver and spleen. The thyroid gland is also enlarged. The enlargement of this organ is thought to depend upon the changes in the blood.

Respiratory Changes. Owing to the increased quantity of blood the elimination of carbonic acid gas must be increased. The mechanical pressure of the growing uterus lessens the longitudinal diameter of the thorax, although the lower thorax is increased in breadth. This decrease in breathing space causes some dyspnœa, which increases until the last weeks of pregnancy, when the uterus sinks again, and respiration becomes easier. In the early months cough and dyspnœa may exist from nervous sympathy, while in the later months the same symptoms may arise from upward pressure. Twin pregnancy or dropsy of the amnion are common causes of such disturbance.

Nutritional and Digestive Changes. Digestive disturbances, including nausea and vomiting, are exceedingly common during the second and third months of pregnancy. Gastric indigestion may also occur, causing acidity, flatulence, heartburn, eructations, etc. Constipation is the rule, but attacks of diarrhœa may occur. Intestinal indigestion causing severe cramps is common. After the nausea and vomiting subside, the digestive activity is increased, and general nutrition improves. An increase in weight takes place in normal cases, irrespective of the growing uterus and ovum. The average gain amounts to from ten to fifteen pounds in the nine months, being greatest in the

last two months. The fat is the tissue most largely increased. These deposits of fat are most marked in the mammary glands, in the abdominal walls, in the hips, and in the omentum. This increase is so much stored-up potential energy to be utilized after delivery, when the physical powers are taxed by lactation.

Changes in the Skin, the Gait, and the Osseous System. The hair follicles, the sebaceous glands, and the sweat glands show increased functional activity.

Pigmentations are observed in spots over the body. They are particularly noticeable upon the abdomen, the face, and around the nipples. A dark pigmented line, the *linea nigra*, is frequently observed, extending from the symphysis to the umbilicus and sometimes continued to the ensiform cartilage. All these pigmentary changes are more marked in brunettes than in blondes. After parturition they diminish in intensity, but rarely completely disappear.

The gait of a pregnant woman undergoes changes, in that the head and shoulders must be thrown backward in order to preserve the centre of gravity. This change in gait is especially noticeable in short women.

Because of the drain on the osseous elements of the blood, a fracture occurring during pregnancy does not unite readily.

Urinary Changes. The kidneys are probably enlarged during pregnancy and furnish a more abundant supply of urine of a lower specific grav-

ity. The qualitative changes in the urine are an increase in the chlorides, and a decrease in the phosphates and the sulphates, which are appropriated by the growing fetus. The Kiestein pellicle often observed upon the urine after standing for several hours has no diagnostic significance.

Glucose sometimes makes its appearance in the urine during the later weeks of pregnancy and is comparatively common during lactation. Some authorities explain the occurrence of sugar as indicative of some disturbance in the glycogenic function of the liver, while others assert that its presence depends upon the quantity and quality of the milk, diminishing as the lacteal secretion is suppressed.

Albumin in greater or less amount is common in the urine during pregnancy. It is not far from the truth that 20 to 30 per cent. of pregnant women have albuminuria at some period of pregnancy. It must be remembered that the presence of blood, mucus, or pus in the urine may be the cause of the albuminuria, so that the presence of albumin does not always indicate that the kidneys are affected. Again in many cases in which albumin exists in the urine, the amount is small and its presence is not constant. In these cases tube-casts are absent, and there are no attending morbid symptoms. The existence of albuminuria during pregnancy demands constant watchfulness on the part of the physician and frequent examinations of the urine. The general condition of the patient must also be attentively observed, and the hygiene of pregnancy rigidly enforced.

Changes in the Nervous System. As a rule, emotional susceptibility is greatly increased. A woman may become fretful, peevish, irritable, and at times unreasonable. In a small proportion of cases the woman feels unusually well and takes a more active interest in everything. More frequently a degree of despondency, entirely beyond the control of the will, is observed. These symptoms may progressively increase in intensity till during the latter part of pregnancy, or soon after labor, melancholia or mania may result.

Pregnancy, Tubal. See *Pregnancy, Extra-uterine.*

Presentations, Breech, Management of.

The management of a breech presentation is a good test of the skill and judgment of the obstetrician. He must avoid interference except for good cause, yet he must be prompt to foresee danger to the child, and to interfere as soon as this danger is manifest. It is a wise precaution to have one skilled assistant in the management of a breech labor. This assistant should give the anesthetic if this is necessary, and should apply suprapubic pressure when rapid extraction is required. The principles in the management of breech presentations are as follows: (1) To prolong the first stage of labor in order to obtain full dilatation of the passages. To this end all voluntary efforts on the part of the patient should be forbidden, and chloroform administered if the pains are severe. (2) Preserve the membranes as long as possible. To accomplish this, make few

examinations and keep the patient in the recumbent position. (3) Watch the fetal heart after the rupture of the membranes and prepare for a rapid delivery. (4) Always follow down the fundus with the hand. The close application of the fundus to the head preserves head flexion and prevents extension of the arms. (5) As soon as the buttocks are born, wrap them in a warm sterile cloth. Relieve the perineum from strain by pressing the hips and the pelvis of the child upward against the pubic arch. (6) When the umbilicus appears, gently draw down a loop of the cord and place it to the rear, if possible opposite a sacro-iliac joint, and watch its pulsations. (7) Hold the hips and the body constantly forward toward the mother's abdomen, but make no traction. (8) As the chin appears, assist in the expulsion of the head by suprapubic pressure, and urge the patient to bear down as strongly as possible. If there is much delay, some form of manual extractions of the head must be employed without delay.

Management of Special Conditions. Non-engagement at the Brim.

When the breech does not engage, one leg should be brought down. The case may then be left to nature, or, if the patient is exhausted, slow artificial delivery may be carried on by means of suprapubic pressure and by traction from below.

High Arrest of the Breech. When the breech is arrested at the brim of the pelvis, five methods of securing descent are applicable: Traction may be made upon the anterior groin with the finger, the

fillet, or the blunt hook; forceps may be applied to the breech; or the hand may be inserted into the uterus and a leg brought down. Of these methods the use of the finger in the groin is the best, but the finger may not have sufficient power to secure descent. If the breech has not firmly engaged, the introduction of the hand to bring down a leg is the method to be chosen when the finger in the groin fails. If the breech is firmly engaged the cautious use of the fillet or blunt hook is permissible. In making traction, care should be taken to direct the line of traction toward the side of the pelvis to which the back of the child is directed, in order to lessen the danger of snapping the femur.

Low Arrest of the Breech. When the breech is arrested low in the pelvis, the use of the finger in the groin is usually effective. If this fails the fillet or the blunt hook can be used to far greater advantage than in high arrest. The application of forceps is not difficult and is usually successful. If the breech lies in an oblique or antero-posterior position, apply one blade of the forceps against the upper sacral vertebræ, and the other blade against the flexor surface of the anterior thigh. If the long diameter of the breech is transverse, apply the blades of the forceps just above or beyond the trochanters.

Upward Displacement of the Arms. When the brim does not allow the passage of the head and the arms, arrest occurs at the time when the tips of the scapulæ appear at the vulva. Further progress is impossible until the arms are free. The

body of the child should be pushed a little upward, and be rotated until its back is directed toward one or other side of the mother's pelvis. The child's body is now pressed well forward toward the symphysis and an attempt made to free the posterior arm. The hand of the operator, whose palm corresponds to the back of the child, is passed upward into the hollow of the sacrum, until two fingers can be passed up along the arm of the child and their tips placed in position in the bend of the elbow. The elbow is now drawn down across the child's face and thorax until the forearm and hand are within reach and can be brought to the vulva. The hips of the child are now swept downward and traction made upon the thighs in the hope that the remaining arm will pass the superior strait with the head. An attempt may be made to release the anterior arm by a procedure similar to that employed with the posterior arm. If this fails, the body of the child should again be pushed back into the pelvis and the child be so rotated that the anterior arm becomes posterior, when it should be released. During this rotation the back of the child should move across the front of the mother's pelvis.

It sometimes happens that an arm gets jammed over the back of the head between the occiput and the pelvic wall. Prompt rotation in the opposite direction may unlock the arm, and the rotation should be continued until the arm becomes posterior.

Extraction of the After-coming Head. It should

be remembered that in breech cases delivery must be completed within five minutes after the birth of the umbilicus in order to secure a living child. The various methods of extraction of the after-coming head are as follows:

1. *Face and Shoulder Traction, or Smellie Method.* The child is laid astride one of the operator's forearms, and the hand of this arm is passed into the vagina until the index and middle fingers are placed one at each side of the child's nose. The other hand grasps the shoulders, the neck being between the first and second fingers. The external hand makes traction upon the child, while the internal hand strives to preserve the flexion of the head. Traction is made directly downward until the occiput is well engaged under the pubic arch. Then the body of the child is raised over the mother's abdomen while the external and internal hands continue to make traction. As the face emerges the external hand must leave the shoulders and protect the perineum by preventing sudden expulsion of the forehead.

2. *Jaw and Shoulder Traction (Smellie-Veit, or Mauriceau Method.)* This method is similar to the Smellie method with the exception that traction is applied by the index finger in the child's mouth. Care must be taken not to fracture the jaw.

3. *Jaw Traction and Suprapubic Pressure (Wigand-Martin Method).* The index-finger of one hand is passed into the infant's mouth, while the other hand presses the head down from above the pubes.

4. *Foot and Shoulder Traction (Prague Method).*

One hand grasps the child's feet from behind, while the other hand grasps the shoulders as in the Smellie method. Traction is made downward and backward until the perineum is well distended. Then the body and the extremities of the child are raised upward over the mother's abdomen, while traction is still made with the hand grasping the ankles. This method is extremely dangerous and should be discarded.

5. *Forceps Extraction.* This method may be used when other methods fail, but is rarely necessary. In applying the blades the child's body is carried up over the mother's abdomen. Forceps should never be used in these cases when the head is above the brim.

Presentations, Brow, Management of. One must never trust to spontaneous rectification in presentations of the brow. The presentation must either be changed to a vertex, or podalic version must be performed. When the brow presents in a *posterior position*, that is, with the occiput anterior, and with the head unmoulded, manual flexion is the operation of choice. This operation is performed by combined internal and external methods. Upward pressure upon the brow; lifting up the brow with the whole hand, or drawing down the occiput with the whole hand, and all combined with external manipulations, should be tried in the order named. After flexion has been re-established forceps should be applied, if engagement does not promptly occur. The conversion of

a brow presentation into a face presentation is not advised.

In *anterior positions* of the brow at the brim of the pelvis manual flexion will produce an occipito-posterior position of the vertex. Some authorities advise this method of treatment, but the majority prefer podalic version. The management of brow presentations after the engagement of the head may be summarized as follows: If the brow is *anterior*, a cautious use of the forceps is permissible. The chances of extracting a living child are small, and symphyseotomy offers the best hope of a living child. Craniotomy is always the best procedure when the child is known to be dead. If the brow has entered the pelvis in the *posterior position*, and the child is still alive, a cautious attempt to promote rotation with the forceps might be justifiable. Craniotomy, however, would probably be necessary.

Presentations, Face, Management of.

1. *At the Pelvic Inlet.* A face presentation when detected while the presenting part is still in or above the brim of the pelvis may be treated as follows: The case may be left to *nature*. This method of treatment is allowable when the chin is anterior; when the woman is a multipara with a history of easy labors; when the soft parts are dilatable; when the pelvis is ample and the child small; when the uterus is powerful and the pains are frequent. When the chin is posterior, or when, in anterior positions, the conditions are anything but the most favorable, interference is necessary.

The possible methods of interference at the brim of the pelvis are *manual flexion of the head, version, and forceps*. The application of forceps to the face at the brim of the pelvis is difficult and dangerous. The choice between version and manual flexion depends upon the position of the chin. If the chin is posterior, manual flexion will produce an anterior position of the vertex. Hence in posterior positions manual flexion should always be tried. If the head does not engage promptly after flexion is obtained it is best to apply forceps at once. If manual flexion fails, version should be performed. In anterior positions of the chin, manual flexion results in an occipito-posterior position of the vertex. Version is the preferable procedure.

2. *In the Pelvic Cavity.* In anterior positions of the chin the progress of the case should be carefully watched, and complete extension maintained throughout the second stage of labor. If any considerable delay occurs, the forceps should be used at once. In applying the forceps care should be taken that the tips of the blades do not press upon the tissues of the child's neck. In *posterior positions* the chin should never be allowed to become deeply engaged. If firm engagement has occurred, the patient should be anesthetized, and the possibility of raising the head above the brim should be tested. If elevation of the head is impossible, and the face becomes impacted in the pelvis, the obstetrician is confronted with the most serious mechanical complication of labor. The child mortality is practically 100 per cent. The maternal mortality

is unknown, but is doubtless high. The application of a blade of the forceps under the chin may favor anterior rotation. If the chin can be brought down to the pelvic floor, it may rotate forward. No attempt should ever be made to deliver the chin over the perineum. Symphyseotomy has been advised, but no case has been recorded in which it was employed. Most authorities advise craniotomy, even when the child is alive.

Presentations, Transverse, Management of.

Transverse presentations should never be left to nature. The malpresentation should be corrected at once by some method of version. If the presentation is detected before any portion of the trunk is deeply engaged, and the membranes are unruptured, *external version* may be attempted, and the breech or the head made to engage. If the membranes are ruptured, and the shoulder has entered the pelvic cavity, *internal podalic version* will give the best results. If the shoulder has become impacted, *decapitation* should be employed, if the neck of the child is within easy reach. If decapitation is difficult, better results may be obtained by a laparotomy.

Presentations, Vertex, Management of.

The management of occipito-anterior positions of the vertex has already been described under the management of normal labor. Occipito-posterior positions of the vertex demand especial consideration. Although many cases of occipito-posterior positions terminate naturally, the labor is often tedious and prolonged, and operative interference

is often demanded. Hence an attempt should always be made to convert the relatively unfavorable occipito-posterior position into the more favorable anterior position. Unfortunately the great majority of occipito-posterior positions are not diagnosticated until labor is far advanced. If a posterior position is discovered before the rupture of the membranes or the engagement of the head, it is usually possible to rectify it by postural treatment. The patient should be instructed to assume the knee-chest position several times daily, to remain in this position as long as possible, and recline upon the right side for a short time before rising. This postural treatment is of the greatest use when employed before any labor-pains have occurred. Even if the patient is not seen until labor has begun, the postural treatment should be tried, if the membranes are unruptured and the head is not engaged. If the postural treatment fails, no treatment is required until after the membranes have ruptured. Frequent examinations should be made in order to detect any tendency to extension of the head. The amount of extension present is the best guide in the treatment of the case after the membranes have ruptured. When the extension becomes so marked that the eyebrows are below the brim of the pelvis, interference is necessary, unless active progress is present.

Operative Treatment at the Inlet. The first step in the treatment is to reëstablish flexion. Anesthetize the patient, and pass the half hand within the os until the fingers cover the forehead, which

should then be gently pressed upward until complete flexion has been secured and the head freed from the brim. Still keeping the fingers on the forehead to maintain flexion, force the head into the brim by external pressure. Should extension recur, an operative delivery of the head is necessary. Three methods of delivery are possible; manual rotation of the head followed by the application of forceps, the application of forceps while the occiput is still posterior, and internal podalic version. Manual rotation of the head and the application of forceps at the brim of the pelvis is difficult, while version is comparatively easy. If the operator is skilled in the use of the forceps, the first method is the better. The ordinary practitioner, however, will get better results from the use of version. If manual rotation is attempted, care must be taken that rotation of the trunk accompanies the rotation of the head. In order to secure complete rotation of the trunk, the fetal body must be grasped, and some authorities claim that such interference is more dangerous to the fetus than a forceps delivery. If version is selected, the head should be flexed before it is raised.

The application of forceps without alteration of the position is a difficult operation, but some authorities believe it offers the best prognosis for the child, if the operator is skillful in the use of forceps at the brim of the pelvis. The axis-traction instrument is to be recommended.

Occipito-posterior Positions in the Pelvic Cavity.
When the head has succeeded in passing the brim

of the pelvis and has fairly entered the pelvic cavity, the maintenance of flexion constitutes the proper management. As soon as the head has entered the excavation and the forehead is within reach, the fingers should be placed against the frontal bones, and upward pressure should be made with each pain until the occurrence of rotation carries the frontal bones backward and out of reach of the fingers. If flexion can be maintained, anterior rotation will almost inevitably occur. When extension has occurred, flexion must be reëstablished before any further progress is possible. We may reëstablish flexion by pushing the forehead up, by drawing the occiput down, or by a combination of these methods. The *vectis*, or one blade of the forceps, may be applied over the occiput to aid in drawing it down. If all efforts at rotation fail, and progress has stopped, the application of forceps is indicated. The cephalic application is to be recommended. No attempt at rotation should be made until the head has reached the floor of the pelvis. When the head has been brought to this point, many authorities favor the rotation of the occiput to the front by means of the forceps. The forceps may be applied in the reversed position, that is, with the lock upside-down. This method of application obviates the necessity of removing the forceps and re-applying them after rotation is complete.

Occipito-posterior Positions on the Perineum.
In many cases the natural forces are able to push the fetal head to the pelvic floor, and then prog-

ress stops. There are two possible methods of delivery: Forceps delivery with the occiput posterior; and rotation of the occiput to the anterior position by the forceps and delivery as in anterior positions. The rotation of the occiput by means of the forceps is the more scientific procedure and gives the better results.

Puerperal Insanity. *See Insanity, Puerperal.*

Puerperal Sepsis. *See Infection, Puerperal.*

Puerperium, Physiology of the.

The puerperium is the period from the completion of the third stage of labor to the time when the uterus has returned to its normal dimensions. The processes involved usually take about six weeks. Pregnancy, labor, and the puerperal state are natural processes, but in all of them the physiological borders so closely upon the pathological that the distinction is sometimes difficult. In the puerperal woman we have to deal with open wounds extending over a large surface, a contused condition of the genitalia, exhaustion following labor, and more or less marked nervous shock. The open wounds and contused surfaces are easily infected, while the lochial discharge and the blood-clots in the uterine sinuses form excellent media for bacterial growth. The puerperium, therefore, demands constant and watchful care in its management to prevent the invasion of disease.

I. General Phenomena.

Exhaustion. Immediately after delivery there is a natural tendency to rest and sleep. After sufficient rest the patient wakes in a state of perspira-

tion and much refreshed and strengthened. Nervous women find difficulty in securing sleep at this period. More or less thirst is present, due to increased excretion by the skin and kidneys. There is also a certain amount of burning pain in the external genitals, depending upon lacerations.

Post-partum Chill. A chilly sensation, or even a distinct chill, is frequently experienced at the close of labor or during the third stage. The pulse and temperature are unaffected. This chill is most frequently observed after rapid labors, and is probably due to the internal congestion, caused by the sudden decrease in the intra-abdominal pressure, which draws the blood away from the surface of the body. The sudden cessation of severe muscular effort and the wetting of the surface of the body by perspiration, blood, and amniotic fluid are other possible causes. The chill is usually of short duration and requires no treatment except warm coverings and possibly a hot drink.

The Pulse. Soon after delivery there is a marked diminution in the pulse rate. From 60 to 70 is about the normal rate after delivery. A rapid pulse at this time should lead the physician to suspect the existence of hemorrhage or some other complication. This slow pulse usually lasts for three or four days in primiparæ, somewhat longer after subsequent births. No completely satisfactory explanation of this phenomenon has been advanced. The complete physical and mental rest has been assigned as a cause, but all cases do not

have the slow pulse-rate. The absence of constancy in this respect appears to point to the nervous system as largely responsible.

The Temperature. At the close of labor the temperature may be from one to three degrees above the normal. Within twelve hours in normal cases the temperature falls to the normal standard. After the first day the temperature is practically normal, although there is a slight daily fluctuation during the first few days, which is probably dependent upon the secretion of milk. Transient elevations of temperature may occur from comparatively unimportant causes, such as emotional excitement, digestive disturbances, or constipation. A persistent elevation of temperature always indicates some pathological condition.

The Respiration. After delivery, the rate of respiration is lowered. The vital capacity is increased. The expired air contains a larger proportion of water and carbon dioxide than normal.

The Skin. Free perspiration is the rule during the first four or five days of the puerperium. The functions of the skin become normal at the end of the first week. The sweating is accompanied by considerable desquamation.

The Digestive Organs. Usually the appetite is diminished until lactation is established. Thirst is usually increased owing to the rapid elimination of fluids by the skin and the kidneys. The bowels are sluggish and seldom move spontaneously.

The Kidneys. During the first few hours after delivery there is usually little desire for urination,

owing to a paretic state of the muscles of the bladder. Retention of urine for twenty-four hours is not uncommon and does not call for the use of the catheter. The daily quantity of urine is increased during the first week. The specific gravity is a little lower than the usual, while the total excretion of urinary solids remains about normal. Albumin is frequently present in the urine passed during the first twenty-four hours after labor, owing to the renal stasis caused by the act of labor. After this time albumin should disappear. Sugar in the form of lactose is found in the urine whenever there is any impediment to the secretion of milk. It disappears as soon as the balance is established between secretion and consumption. Peptonuria attributed to the involution of the uterus may exist for several days after delivery, but its presence is not constant.

Weight. During the first puerperal week there is a loss of weight, variously estimated as from one-twelfth to one-eighth of the body-weight at the close of labor. This loss results from the increased activity of the secretions and excretions, the small amount of food taken, and the retrograde changes in the pelvic organs. Under modern methods of nourishment the loss of weight is not excessive, and in about six or eight weeks the body-weight should again be normal. Delicate women may not regain their normal weight for months.

II. *Local Phenomena.*

External Genitals. After delivery the external

genitals are bruised and swollen. In primiparæ the hymen and the fourchette are invariably torn. The tear in the hymen is usually stellate, and after involution traces of the membrane remain in the so-called *carunculæ myrtiformes*. The labia majora and minora gape, and if labor has been prolonged there is considerable œdema. The superficial and deep contusions and lacerations gradually disappear, leaving whitish scars.

Vagina. More or less laceration of the vagina always occurs. Small lacerations heal spontaneously, if kept clean. More serious lacerations heal chiefly by granulation, and may leave extensive areas of scar-tissue. The vagina is at first relaxed, the mucous membrane is smooth, and the rugæ are absent. In a few weeks it nearly regains its former condition, although the folds never acquire their original number nor depth. As a result of labor the vagina becomes somewhat larger and shorter. The outlet tends to remain somewhat patulous.

Cervix and Cervical Canal. The cervix after delivery is much distorted, but the external os can always be recognized. Lacerations of the cervix are usually present. At the tenth day after delivery the internal os admits the passage of the index finger in about 60 per cent. of primiparæ and about 70 per cent. of multiparæ. Soon after that time the internal os closes. The external os admits the finger for a much longer time and never entirely regains its former condition.

The Lochia. The genital discharges of the puer-

perium are termed the *lochia*. In normal cases the uterine lochia is to be regarded as sterile. A diminution in the usual amount of the discharge should be regarded with suspicion, as suppression of the lochia is often a sign of infection.

Involution. In all the pelvic organs which have undergone hypertrophy during pregnancy a corresponding atrophy of the tissue-elements occurs during the puerperium. This retrograde change is termed involution. In primiparæ the return to the virgin condition is never complete, particularly in the uterus and the vagina.

The Uterus. The uterus immediately after labor weighs from 800 to 1,000 grammes. It measures from 15 to 20 cm. (6 to 8 inches) in length, and from 11 to 12 cm. ($4\frac{1}{2}$ to $4\frac{3}{4}$ inches) in breadth at the level of the Fallopian tubes. The wall of the upper uterine segment is from 3 to 4 cm. ($1\frac{1}{8}$ to $1\frac{1}{2}$ inches) in thickness. The uterine cavity is from 15 to 16 cm. (6 to $6\frac{1}{4}$ inches) in depth. At the eighth day of the puerperium the mass of the uterus should be reduced one-half. At the end of two months the uterus has regained its original weight of 50 to 75 grammes (1.85 to 2.75 ounces) and its length of 7 cm. (2.95 inches). At the close of labor the fundus uteri lies about midway between the umbilicus and the upper border of the symphysis. In about six hours after delivery the fundus is about on a level with the umbilicus. From this time the height of the fundus diminishes each day until by the tenth or twelfth day the fundus is at the level of the pubic bones. The normal

position of the uterus at this time is one of anteversion or ante flexion, which increases as involution progresses. Involution is retarded after hydramnios, twin births, labor in contracted pelves, hemorrhage, premature labor, and in puerperal sepsis.

Uterine Muscular Tissue. The reduction of the enormously hypertrophied muscular fibres of the pregnant uterus is accomplished by fatty degeneration. This degenerative change affects the protoplasm of the muscle fibres. The fat-drops form large collections between the muscular bundles, and absorption occurs through the blood- and lymph-capillaries. The connective tissue undergoes similar changes.

Uterine Vessels. At the placental site some of the sinuses have been closed by thrombi in the last month of pregnancy. The remaining ones are closed after delivery by the contractions of the uterus, which bring their walls into apposition, causing the formation of a clot. The larger blood-vessels in the uterus are partially or wholly obliterated by proliferation of the intima associated with fatty degeneration of the media. In multiparæ the coats of the uterine arteries remain permanently thickened, and the arteries are larger than in the nulliparous uterus. The walls of the venous sinuses are thickened and convoluted for several weeks after delivery; the location of the placental site is manifest many months after labor.

Uterine Mucosa. When the membranes separate

at the close of labor, a thin layer of decidual tissue remains attached to the uterine wall. From this granular layer, and from the epithelium lining the glands of the uterus, the new mucous membrane is generated. The tissue which is not utilized in the formative process undergoes fatty degeneration and is gradually thrown off in the lochial discharge. By the end of the fifth week the new mucous membrane is complete.

Tubes, Ovaries and Peritoneum. The dilated and stretched tubes gradually become narrow and tortuous; the ovaries atrophy to their normal size; the peritoneal coat of the uterus contracts and the folds of the broad ligament resume their usual position.

Puerperium, Treatment of the.

The main treatment of the puerperium may be discussed under three heads: (1) proper nutrition; (2) absolute rest of body and mind; (3) strict asepsis.

Nourishment. There is considerable difference of opinion in regard to the proper diet for the first two or three days after delivery. The weight of opinion favors a light, easily digested diet until lactation begins. The simple diet of the first few days should then be materially, though gradually, increased. By the sixth or seventh day, the patient should be taking the food that would be suitable to any healthy person confined in bed without physical exercise. The following diet list will fill the requirements:

First 48 Hours. Milk, hot or cold ($1\frac{1}{2}$ to 2 pints

a day), gruel, beef-broth or chicken-broth, one cup of tea or cocoa, thin bread and butter, milk toast, any breakfast cereal thoroughly cooked.

Second 48 Hours. Liquids as above with the addition of coffee. Any breakfast cereal; scrambled, soft-boiled or poached eggs; lamb chops; beefsteak; broiled or creamed chicken; baked, mashed or stewed potatoes; macaroni; celery; lettuce; fruits; fresh vegetables, such as peas, asparagus, and string beans in season and in moderation; boiled or baked custard; wine jelly; simple puddings, as rice and tapioca.

Nursing mothers should avoid pork, veal, cabbage, turnips, cucumbers, corn, beans (canned and dried), vinegar, strawberries and melons. After the first week extra nourishment, preferably in the shape of milk between meals, should be ordered.

Rest. Absolute mental and physical rest is of the utmost importance. A sound sleep of several hours after delivery is a favorable prognostic sign. Care should be taken, therefore, to procure rest and absolute quiet for the mother as soon as possible after the necessary attentions after delivery have been completed. The room should be darkened, the child should be removed to another room, and all visitors rigidly excluded. The nurse, however, should from time to time note the pulse and general condition of the patient, and the presence of firm uterine contraction.

Physician's Visits. The first visit should be made within twelve hours after confinement. A systematic examination of both mother and child

should be made at each visit. At each visit attention should be paid to the mother's temperature, pulse, and respiration; the height and condition of the uterus; after pains; the quantity, odor, and character of the lochia; the condition of the bladder and the bowels; the condition and secretion of the breasts; the nipples; diet, and general condition of the patient. Note should also be taken of the child's temperature, pulse and respiration; the condition of the cord and the umbilicus; the number and color of the stools; the passage of urine; the condition of the eyes; the stomach as shown by vomiting; the weight; the condition of the nose and mouth; the general condition as to sleep, excessive crying, colic, etc. The temperature, pulse, and respiration of the mother should be taken and recorded twice daily, and any departure from the normal standard should call for careful investigation into the cause. The height of the fundus above the symphysis should be estimated or measured at each visit. Sensitiveness over the uterus and in the iliac fossæ, elicited by abdominal palpation, points to metritis, perimetritis or parametritis. After-pains are caused by irregular and painful uterine contractions, and are often due to the presence of clots of blood *in utero*.

The amount and character of the lochia should be carefully investigated. The amount is usually estimated by the number of napkins. Under normal conditions the vulvar pads should not require change oftener than six times in the twenty-four hours for the first four or five days. Marked

diminution in the lochial discharge associated with a putrid odor should lead to the suspicion of sepsis. The lochial stain in healthy cases is red in the centre, gradually fading away toward the periphery. In cases of putrid lochia the circumference of the stain is well marked, while the color at the centre is lighter. The odor of normal lochia is sometimes heavy, but not offensive. A frequent and annoying complication is retention of urine. The use of the catheter should be avoided as far as possible, and urination should be encouraged in every possible way. For the treatment of this complication, *see Urine, retention of.*

The bowels should be opened by the third day. For this purpose a laxative is given at the end of the first forty-eight hours. Castor oil, from one-half to one ounce, is efficient, but unpalatable. It may be taken in warm milk or in soda-water. Citrate of magnesia is palatable and efficient. Compound licorice powder is a good preparation. If the rectal contents are hard, an injection of two or three ounces of sweet oil will render the passage of the hard fecal masses less painful. The post-partum pill prepared according to the formula of Dr. Fordyce Barker is a favorite preparation with the writer. A laxative may be given from time to time while the mother remains in bed, but enemata are preferable. The breasts and the nipples require attention in many cases.

For the treatment of engorgement of the breasts *see Breast, diseases of.* For the treatment of sore nipples, *see Breast, diseases of.*

Posture and Duration of the Puerperium. For the first few hours after delivery the head should be kept low to guard against cerebral anæmia. For twenty-four hours at least the patient should not be allowed to turn on her side, owing to the possible danger of air-embolism. After the second or third day the posture of the patient may be left to her own choice. The patient should be encouraged to turn first on one side and then on the other, and later to lie on the abdomen for considerable periods of time. The object of this posture is to avoid backward displacement of the uterus, which is liable to occur if the patient lies upon her back continuously. The recumbent position in bed should be maintained until the uterus can no longer be felt above the symphysis by external palpation. Ten days to two weeks is the usual time consumed. At the beginning of the third week the patient may be lifted into a reclining chair or on a sofa, and may sit up for a short time each day. After the fourth week she may go about the house or drive in the open air, but should not resume her household duties, or do any lifting, long standing, or walking until involution is complete. Patients even after leaving the bed should lie down at intervals during the day, and the occurrence of a backache should be regarded as a warning against standing or walking or any kind of work. Getting up too soon and too early resumption of household duties are important factors in the production of uterine displacements and prolapse.

The Examination of the Puerperium. It should be the rule in private practice as it is in hospitals to make a careful bi-manual examination before the patient is discharged. If this were the rule, many abnormalities would be discovered at a time when they are most amenable to treatment, and many minor derangements could be corrected, which, if untreated, become aggravated.

Putrefaction, Fetal. See *Death of Fetus in Utero.*

Pyosalpinx, Puerperal. See *Salpingitis During Pregnancy and in the Puerperium.*

Quickening. See *Pregnancy, Diagnosis of.*

Quinine in Labor, and in the Puerperal State. Quinine is largely used at the present day as a uterine stimulant in cases of delayed labor in the first stage. Fifteen grains in two cachets given within half an hour is the dose recommended. If the stomach is irritable, twenty to thirty grains of the bi-sulphate of quinine may be given in rectal suppositories.

Quinine as a remedy for malaria in pregnancy and in the puerperal state has a well-deserved reputation. The belief entertained by some physicians that quinine is liable to cause an abortion should not prevent its use in malaria, as its advantages are many and obvious, while its action as an abortifacient is uncertain.

In puerperal infection quinine has been largely used, but its influence for good is problematical. The only form of puerperal infection in which quinine may prove helpful is in prolonged cases, as,

for example, in pyemia. At the present time the practice of treating the fever due to puerperal infection by antipyretics is practically obsolete.

Rachitis, Fetal. Rachitis of the new-born occurs in two forms—the fetal and the congenital. Both forms originate *in utero*, but in the fetal form the disease is fully developed at birth, while in the congenital form it continues to develop after birth. The essential feature of fetal rachitis is an excessive and irregular development of the periosteal cartilage associated with a deficiency in the deposit of calcareous matter. The result is bony deformity. The long bones develop more laterally than longitudinally; the extremities are short, thick, and usually curved; the skull-bones are thick; the ribs show nodular enlargements; deformities occur in the spinal column and in the pelvis, and the thorax shows the “pigeon breast.” The head is often large, the neck thick and short, the abdomen protuberant. Other diseases of the bones which resemble rachitis are described under the names of Schmidt’s, Bidder’s and Müller’s diseases.

Rachitic Pelvis. See *Deformities, Pelvic*.

Retroversion of the Gravid Uterus. The most frequent uterine displacement complicating pregnancy is retroversion. The cause of retroversion may be previous uterine disease, relaxation of the round ligaments, or traumatism. It is more likely to occur in contracted pelves, especially if the promontory of the sacrum is prominent.

Symptoms. Painful urination, associated with

pain and dragging sensation in the back, and obstinate constipation are the prominent symptoms. Vomiting from reflex causes is a common symptom. On vaginal examination the cervix is found elevated and directed upward and forward, the body of the uterus distends Douglas's pouch, and perhaps pushes the posterior vaginal wall forward and downward to the vulvar orifice.

Terminations. In uncomplicated cases where no peritoneal adhesions exist retroversion usually disappears with the upward growth incident to pregnancy. If *spontaneous reposition* does not occur, and the upward growth of the uterus is prevented by the promontory of the sacrum, the condition is known as *incarceration*. *Spontaneous abortion* may occur, but is not a frequent termination.

Incarceration. The *symptoms* of incarceration are vesical irritation and pain in the back, and obstinate constipation from pressure of the fundus. The urethra is more or less completely obstructed by the stretching of the canal in the direction of its long axis and by the pressure of the cervix against the symphysis. Painful contractions of the distended bladder occur at intervals, and a small quantity of urine is voided. The patient complains of vesical tenesmus and incontinence, while the bladder, full to bursting, is palpable as a tumor above the pubes. Vomiting, fever, and all the symptoms of obstruction of the bowels make their appearance. Agonizing pain, referred to the sacral, lumbar, and hypogastric regions, is constant.

Œdema of the vulva, the perineum and of the lower extremities is marked, while locomotion is usually impossible.

Diagnosis. The diagnosis is commonly simple when the fact of pregnancy is established. The distended bladder presents characteristic features, and fluctuation is distinct unless the intravesical tension is exceptionally great. There is often dribbling of urine, and some authorities assert that dribbling of urine in a woman pregnant at the third or fourth month is a certain sign of incarceration. Extrauterine pregnancy may simulate incarceration. In ectopic pregnancy, while the uterus may be somewhat enlarged, the normal relations of the cervix and fundus are preserved; distention of the bladder does not usually occur, nor is there œdema of the vulva, or perineal distention. In cases of incarceration uterine contractions may be recognized. In doubtful cases examination under anesthesia, with the bladder empty, is necessary to establish the diagnosis. Intra uterine polyp is differentiated by the menorrhagia which accompanies that condition. The presence of a tumor corresponding to the uterus within the pelvic cavity, and the absence of such a tumor from the hypogastrium, exclude at once incarcerated fibroids, ovarian cysts, hematocele and hematoma.

Terminations. Occasionally spontaneous restitution, complete or incomplete, takes place. More frequently, uterine contractions are excited, and abortion occurs. The abortion is usually incom-

plete. When these natural terminations do not take place, and when aid is not rendered, death is inevitable. That incarceration of the pregnant uterus is a serious condition may be inferred from the fact that one authority collected 67 deaths from this condition reported in medical literature. The immediate causes of death were as follows: Uremia and collapse, sixteen cases; septicæmia arising from the bladder, four; gangrene of the bladder, three; rupture of the bladder, eleven; peritonitis from disease of the bladder, seventeen; pyemia, three; rupture of the peritoneum and vagina, two; improper efforts at reposition, five; gangrene of the intestine and peritonitis, one; occlusion of the intestine, one; and four cases in which the immediate cause of death was not stated. It will be noticed that the urinary retention and its ultimate results bear the strongest relation to the death rate from this condition. As the intravesical tension increases the walls of the bladder become thinned out, the blood supply is diminished, and necrosis of the mucous membrane ensues. The urine undergoes ammoniacal decomposition, with the production of cystitis, which soon is transferred into diphtheritic inflammation with sloughing of the entire mucous membrane. Partial or complete rupture of the bladder follows under the constantly increasing tension. Retrostasis of the urine along the ureters induces pyelitis, pyelo-nephritis, hydro-nephrosis, and the like.

General peritonitis is of rare occurrence except

as a symptom of septicæmia or after perforation of the bladder.

Treatment. The treatment of uncomplicated retroversion of the gravid uterus is not difficult. With the bladder and the bowels empty, and with the patient in the knee-chest position, reduction is usually not especially hard to accomplish. After replacement the uterus must be maintained in its proper position by a pessary or tampon, large enough to be efficient. Once in four or five days the tampon should be removed and the vagina irrigated with warm water or a saturated solution of boracic acid. If the uterus is bound down by adhesions, steady and long-continued pressure should be maintained by thoroughly tamponing the posterior cul-de-sac through a Sim's speculum, with the patient in the knee-chest position. The tampons must be renewed daily. If this fails, abortion should be induced before incarceration occurs.

In the treatment of incarceration strict asepsis must be observed. The first step in the treatment is to empty the bowels and the bladder. It is sometimes exceedingly difficult to pass a catheter owing to the height of the bladder and the compression of the urethra. By drawing down the cervix with a volsellum the passage of the catheter will be aided. If it is not possible to pass the catheter, the bladder must be aspirated about two inches above the symphysis. After the bladder and bowels have been emptied, efforts at reduction should be made under anesthesia. If not suc-

cessful, the induction of abortion becomes necessary. If the cervix cannot be reached by drawing it down with a volsellum, the uterus should be aspirated through the posterior vaginal cul-de-sac. In rare cases the induction of abortion may be impossible, and vaginal hysterectomy will be necessary. Laparotomy with manual replacement of the uterus has been done with success in some recent cases of this complication of pregnancy.

Rheumatism, Puerperal. It has been asserted that the puerperal patient is especially predisposed to rheumatism. It is, of course, possible that rheumatism may occur as an inter-current affection, but the great majority of the so-called rheumatic affections of the joints in the puerperium are due to sepsis. A septic arthritis is differentiated from true rheumatism by the absence of acid sweats, of cardiac complications, and of marked febrile reaction. One of the large joints, usually the knee, is affected; the other joints are very rarely affected in succession. The disease has a long duration and a marked tendency to ankylosis or to suppuration. A history of gonorrhœa can often be obtained. The treatment consists in careful disinfection of the parturient tract and in keeping the joint at rest. The application of a 5 per cent. solution of creolin in glycerine, or of iodine vasogen, 6 per cent., will prove helpful. After the acute inflammatory symptoms have subsided, passive motion should be cautiously employed.

Rotation, Internal. See *Labor, Mechanism of.*
Rupture of the Uterus. See *Uterus, Rupture of.*

Salivation of Pregnancy. In cases of severe nasua and vomiting of pregnancy, salivation is frequently observed. A constant dribbling of the saliva by day or by night is a very annoying condition, and it may persist for a long time after the cessation of the nausea and vomiting. Sometimes the amount of saliva expectorated in twenty-four hours may reach two or more quarts. The general health may become impaired, and the patient's life may be endangered from inanition. The mucous membrane of the mouth becomes red and swollen, but there is no fetor to the breath, and this distinguishes the affection from mercurial ptyalism. The saliva is altered in composition, the organic and inorganic constituents being diminished, while the water is much increased. In some cases the ptyalin is greatly decreased in amount, or even absent. Salivation of pregnancy is a most obstinate condition often repeated in subsequent pregnancies and difficult to cure. It is supposed to be due to a neurosis or toxemia.

Treatment. Administer nutritious, concentrated food in small quantities at short intervals. Among the Homœopathic remedies which will be found helpful are the following: *Coffea*, *Helonias*, *Iodine*, *Jaborandi*, *Kreosote*, *Lactic acid*, *Mercurius*, *Nitric acid*, and *Nux vomica*.

Salpingitis During Pregnancy and in the Puerperium. Salpingitis during pregnancy complicates the pregnant condition by reason of the adhesions usually present with the salpingitis. As the uterus increases in size, tension upon these adhesions

causes considerable pain, and, if the adhesions will not stretch, abortion is frequently the final result. Salpingitis is not a trifling complication of pregnancy, as there is always present the danger of rupture of the tube with the development of an acute septic peritonitis. If a pus-tube can be definitely diagnosed during pregnancy, it should be removed by laparotomy. It is a well-known fact that major operations are well borne during pregnancy, and the risk to life from the presence of pus within the pelvis should outweigh the possibility of causing an abortion by the operation. Salpingitis occurring in the puerperium is usually due to direct extension from a septic endometritis. In a small proportion of cases the salpingitis is due to infection through the lymphatics.

Salt Solution. The salt solution commonly employed consists of a drachm of salt to a pint of water. After the solution has been prepared it should be boiled and filtered. The temperature of the solution at the time of using should be from 100° F. to 105° F.

This salt solution is employed by rectal infusion as a preventive or curative measure in shock, especially of shock from hemorrhage.

The most common method of using the salt solution is by intravenous infusion. This method is employed in sepsis, in eclampsia, and in toxemia. The technique has been described under post-partum hemorrhage.

The salt solution is also used by hypodermoclysis. The usual site for these injections is the

loose cellular tissue beneath the breasts. The space between the crest of the ilium and the lower border of the ribs may be selected. The temperature of the solution should be about 105° F. and a large aspirating needle should be used. See *Injections, Intravenous*.

Sapremia. The term *sapremia* means general putrid infection in distinction from general septic infection which is termed *septicæmia*. The cause of a genuine sapremia is the absorption of toxic products of decomposition. The substances which by their decomposition furnish these toxic substances may be retained placenta and membranes, pent-up lochia, portions of gangrenous uterus, fibroid tumors, etc. It is believed by many obstetricians that the term sapremia has been grossly abused, and that many cases are included under it which really are due to infection with the ordinary pyogenic organisms. One authority holds the view that we are not justified in considering a case as sapremic unless the lochia have been examined by bacteriological methods and found to be free from pyogenic bacteria. Clinically the symptoms of sapremia vary with the amount of poison absorbed. In severe cases there is a chill, followed by high fever, headache, vomiting, and possibly some delirium. The abdomen is bloated and usually tender to touch. The pulse may reach 160. The patient may die in the first twenty-four or forty-eight hours, or she may linger for one or two weeks. With the prompt removal of the decomposing material, recovery is usually rapid and

complete. There is very little tendency for the trouble to extend to neighboring organs, and no permanent effect is manifest in the uterus.

Scarlet Fever in Pregnancy. Scarlet fever is a serious complication of pregnancy. The woman may or may not abort according to the severity of the case. The incubation period is from three to five days. If abortion occurs, the fetus often shows evidences of the disease.

Scarlet Fever, Puerperal. Scarlet fever is a rare complication of the puerperal state. The infection occurs as a rule through wounds in the genital canal. The incubation period is shortened to twenty-four or forty-eight hours. The rash often begins at the vulva and spreads over the trunk. The diagnosis in slight cases is often obscure, as erythematous rashes are frequently observed in septic conditions. The diffuse nature of the rash followed by desquamation; the characteristic tongue; the affection of the throat; a history of exposure to the disease; the occurrence of scarlatinous nephritis, and the infection of those who come in contact with the patient will confirm the diagnosis. Scarlet fever has a very unfavorable influence upon the puerperal state. The milk-secretion is lessened or entirely suppressed; fetid lochia is often noted, and there may be an increase or a return of the lochia rubra. Pelvic inflammation occurred in a considerable percentage of the recorded cases. Diarrhoea may develop early in the attack. It is an unfavorable sign. The *prognosis* is grave. If the pelvic organs are involved

to any considerable extent, there is slight hope of recovery. The *treatment* for the ordinary form without inflammation of the pelvic tissues should be the same as under ordinary conditions. Where infection has occurred the treatment for puerperal infection of a severe type must be employed.

Schultze's Method of Artificial Respiration.

See Asphyxia Neonatorum.

Sclerema Neonatorum. *See Infant, New-born, Diseases of.*

Secundines, Retention of. The most frequent cause of hemorrhage in the puerperium is retention of a portion of the secundines. When doubt exists regarding the retention of small pieces of membrane, an expectant plan of treatment is safer than prolonged intra-uterine manipulation. *See Hemorrhage, Post-partum.*

Sepsis, Puerperal. *See Infection, Puerperal.*

Sex of Fetus, Determination of. It has been asserted that the sex of the fetus could be determined by the fetal heart-rate. A rate of 120 or less indicates a boy, while a rate of 130 or over indicates a girl. While it is true that the fetal heart-rate is usually slower in large children, and large children are more frequently boys than girls, yet little reliance can be placed upon this method of determining the sex of the fetus before delivery.

Small-pox in Pregnancy. *See Variola in Pregnancy.*

Souffle, Umbilical. *See Pregnancy, Diagnosis of.*

Souffle, Uterine. *See Pregnancy, Diagnosis of.*

Spondylolisthesis. See *Deformities, Pelvic.*

Sterilization. See *Antisepsis.*

Stomatitis, Aphthous. See *Infant, New-born, Diseases of.*

Striæ Gravidarum. Abdominal striæ, silvery streaks or white lines, are seen on the abdominal wall as the result of a first pregnancy. New ones may form in subsequent pregnancies. These striæ may also be seen on the hips, thighs and breasts. The color of these markings is at first pink or bluish-red. After delivery the cicatrix becomes white or pearl-colored. The stretching of the skin with partial rupture of the deeper layers accounts for the occurrence of striæ gravidarum. They are not peculiar to pregnancy.

Strychnine in Pregnancy and Labor. Strychnine appears to be a valuable remedy in the treatment of general debility in pregnancy. It has a general tonic effect in these cases and acts as a prophylactic against a flabby uterus after delivery. Edgar advises a dose of $\frac{1}{60}$ grain three times daily, beginning at not less than four or more than eight weeks before the expected confinement. One week before the date of confinement the dose may be increased to $\frac{1}{30}$ grain.

Strychnine may also be used as a remedy in uterine inertia during the first stage. The dose should be $\frac{1}{60}$ grain every fifteen minutes until $\frac{1}{20}$ grain has been given. In this condition the drug should be given by hypodermatic injection.

Subinvolution. Subinvolution is a retarded or incomplete involution of the puerperal uterus.

Etiology. The cause of the changes occurring in the uterus after delivery is a diminution in the blood-supply. It may be asserted, therefore, that any condition which interferes with a rapid diminution of the blood-supply to the uterus may be a cause of subinvolution. Nature's method of decreasing the quantity of blood in the uterus is the firm contraction of the muscle-fibres. Hence any condition which interferes with the firm contraction of the uterus is a cause of involution.

Among conditions which interfere with the normal decrease of the blood-supply of the uterus may be mentioned hyperplasia of the endometrium occurring in the latter months of pregnancy, or an endometritis developed after delivery, the result of septic infection; lacerations of the cervix or of the perineum with uterine displacement, together with uterine and peri-uterine inflammation; fibroid tumors in the uterine wall; and cardiac and hepatic diseases causing a passive congestion of the pelvic viscera. Later in the process of involution chronic constipation, assuming the erect posture and doing hard work, or resuming sexual intercourse too soon after delivery, are causes which often retard, or even arrest, involution. Among the conditions that may cause subinvolution by interference with the firm contraction of the uterus are large masses of hypertrophied decidua that sometimes develop at the placental site, placental polypi, placenta succenturiæ, large blood-clots, and displacement of the uterus. Some local disorder, therefore, is the usual cause of

subinvolution. It is possible that constitutional disturbances may occasionally cause subinvolution, but it is the part of wisdom to search carefully for a local cause.

Diagnosis. The diagnosis is usually easy. The uterus remains larger than normal, is soft and tender upon pressure. The lochia persists longer than usual, or there is a return of the lochia rubra after it has ceased. The patient complains of a feeling of weight in the pelvis, backache, and pain or tenderness over the lower portion of the abdomen.

Treatment. The proper management of the puerperium will prevent subinvolution in many cases and is of the utmost importance. When the condition has once developed the proper treatment depends upon the cause. If there is retention of placental or decidual tissue, the uterus must be curetted. If there is a laceration of the cervix or vagina, it must be repaired. Displacement of the uterus must be corrected, and a suitable pessary applied. Pelvic tumors may be removed. Hot vaginal douches, glycerine tampons, and free catharsis will deplete the pelvic viscera. The general health must be maintained by careful attention to hygiene and proper diet. Recovery will be greatly aided by the exhibition of the carefully selected Homœopathic remedy.

Superfetation. *See Pregnancy, Multiple.*

Sutures of Fetal Head. *See Head, Fetal.*

Symphiseotomy. An operation for the division of the ligaments which unite the two halves of the

pubic bones. The object of this operation is to enlarge the pelvic inlet to facilitate delivery in contracted pelves. Sigault, of France, originated the operation as applied to the living subject. The first operation on the living woman was performed by Sigault in 1777. The new operation was received with great enthusiasm, but through faulty technique fell into disuse. It was revived in 1866 by Prof. Morisani, of Naples. The technique was greatly improved and the mortality largely reduced. In 1892, the operation was performed in this country by Dr. Charles Jewett. Prof. Barton Hirst did the operation a few days after Jewett. Since that time the operation has been frequently performed, and the indications for its employment fairly well defined.

Indications. The operation should be the alternative of version in simple flat pelves, with a conjugate diameter between 7 and 9 cm. (2.6-3.1 inches). Such a case may be allowed to remain in active labor for twenty-four hours. If the head is not engaged at that time, axis traction forceps should be applied. If this procedure fails, a choice may be made between version and symphyseotomy. Version is usually practicable with a conjugate over seven centimeters, but the fetal mortality is about 33 per cent. Symphyseotomy, properly performed, insures a living child but is dangerous to the mother. In generally contracted pelves with a conjugate diameter between 8.2 and 10 cm. (3.2 to 3.9 inches), some operators advise symphyseotomy, while others reject it. The com-

petitive procedures are the induction of premature labor and Cesarean section. Symphyseotomy is also advised in mento-posterior face presentations which are irreducible or impacted, and in cases of impaction in occipito-posterior presentations, with a conjugate below 9 cm. (3.5 inches). These views are not endorsed by the majority of obstetricians. It is essential for the success of symphyseotomy that the pelvis be large enough for the passage of the child, as it must be delivered by forceps after the operation has been done. Hence the capacity of the pelvis to receive the head should be judged not only by direct measurements, but also by trying whether the head can be crowded into the excavation by supra-pubic pressure, or can be made to engage by careful traction with the forceps.

Morbidity. The post-operative complications of symphyseotomy are many. Shock occurs but rarely, but sepsis in varying degree is common. Simple suppuration of the wound occurs in about 10 per cent. of all cases. Other post-operative complications occasionally observed are hematoma, abscess, stitch-abscess, fistula, permanent separation of the pubic bones, lymphangitis, cystitis, incontinence of urine, urinary fistula, infectious myelitis, neuralgias and arthritis of the sacro-iliac synchondrosis.

Mortality. The maternal mortality is about 10 per cent. The infantile mortality is 12 to 14 per cent. The infantile mortality does not result entirely from the operation. A certain number of deaths are due to attempts at forceps extraction

before symphyseotomy is performed. Some of the deaths result from prolapse of the cord, eclampsia of the mother, etc.

Method of Operation. There are three distinct methods: The French, or open method; the American, or subcutaneous method; the Italian, or suprapubic method. The Italian seems to be the preferable method.

Italian, or Suprapubic Method. The abdomen and pubic region are cleansed and disinfected as for abdominal section. A vertical incision about an inch long is made in the abdominal wall, terminating below at a point 1 centimeter ($\frac{2}{5}$ inch) above the upper end of the symphysis. The attachment of the recti muscles is severed by a transverse cut just sufficient to admit the finger behind the symphysis. The forefinger of the left hand is passed behind the symphysis and hooked under the inferior ligament. An assistant inserts a metallic catheter into the urethra, holding it down and to the right side. The curved Galbiati knife is then passed along the index-finger of the left hand until it glides under the symphysis. With an upward and forward movement of the knife the symphysis is divided. Often the subpubic ligament is not divided by this procedure. A smaller curved knife is introduced and the ligament severed from below upward. At this point there may be considerable hemorrhage, which is readily checked by packing the wound firmly with sterile gauze. The Italian operators wait for spontaneous expulsion. If this does not occur after a

reasonable time, the child is extracted with the forceps. The cutaneous incision is then closed and an immovable plaster-of-Paris dressing applied. Some operators use a simple spica bandage to secure apposition of the bones.

French, or Open Method. The incision is made exactly in the median line and extends from above the symphysis to the root of the clitoris or turning to one side of the clitoris to avoid wounding the blood-vessels. The length of the incision is from 8 to 10 centimeters ($3\frac{1}{2}$ to 4 inches). The insertion of the recti is divided so that the finger may protect the bladder. The symphysis is then divided from above downward, and from before backward. The sub-pubic ligament is divided last. If the operator now believes that the separation of the bones is ample for delivery, a temporary dressing is applied to the wound and the delivery left to nature. Some of the French operators insert periosteal sutures before closing the cutaneous wound. Others employ mechanical devices to secure apposition of the pubic bones.

Sub-cutaneous, or Ayer's Method. The cervix should be fully dilated. The urethra and bladder are held to one side by a sound. The initial incision is made a little above the subpubic arch and under the elevated clitoris. The left index-finger in the vagina is held firmly against the posterior surface of the joint. A probe-pointed bistoury is now substituted for the tenotomy knife and carried to the top of the joint, where it meets the index-finger. The bistoury is then carried down-

ward through the joint until it gives way. A small gauze compress is now pressed against the incision beneath the clitoris. The child is delivered by forceps, if possible. The operator must refrain from immediate repair of the cervix or perineum, if lacerations occur. A soft rubber retention catheter is left in the bladder. The vulva is dressed with gauze and the pelvis strapped with adhesive strips. The gauze is removed in thirty-six hours, and the vulva and vagina are irrigated twice daily.

After-treatment. It is not necessary to suture the pubic bones, although some operators still advise it. Adhesive straps of rubber plaster supplemented by a firm binder around the hips answer every purpose. The bed should be firm enough to avoid sagging, and the sides of the pelvis should be supported by sand-bags, extending at least to the knees. An excellent apparatus for maintaining the bones in position is Ayer's hammock-bed. The patient is put to bed straight on her back, with the knees tightly tied together. Catherization is usually necessary, and much care must be taken to keep the parts clean. When the bed-pan is used the greatest care is necessary to avoid pulling the ends of the bones apart. The binder must be carefully watched and tightened whenever the slightest slackness is noticed. The bowels should be kept open as in other cases. The pelvic bandage is worn from four to six weeks. The patient may usually leave her bed at the end of three weeks.

Syphilis, Fetal. See *Fetus, Diseases of.*

Syphilis in the New-Born. See *Infant, New-Born, Diseases of.*

Tampon, The. The tampon may be applied to the vulva, the vagina, the cervical canal, or the uterine cavity. The vulvar tampon is used in cases of hematoma into the labia, where rupture has taken place. The vaginal tampon is useful in inevitable abortion, in placenta prævia and in hydatiform moles. In placenta prævia it is combined with the cervical tampon. In the treatment of post-partum hemorrhage the uterine tampon may be used. The best materials for a tampon are gauze and absorbent cotton. The method of applying the vaginal tampon is important. If cotton is used, the pledgets are soaked in a weak solution of Carbolic acid. The patient is placed in the Sim's position, the perineum is retracted with a Sim's speculum, and the cotton balls are packed closely around the vaginal portion of the cervix and then from above downward into the vagina. A T bandage is then applied to hold the tampon in place. The tampon is left in place for twelve to twenty-four hours. If another tampon is necessary, the vagina is thoroughly douched with a mild antiseptic solution, the bladder and rectum are emptied, and the second tampon applied. Many prefer to use strips of sterilized gauze as a material for the tampon. To be effective the tampon must completely fill the anterior and posterior cul-de-sac. For the intra-uterine tampon, plain sterile gauze is used. When other means fail to control the hemorrhage in a case of post-partum

hemorrhage, the intra-uterine tampon should be used. A convenient instrument for applying the intra-uterine tampon is the surgical dressing-packer.

Teeth, Care of, During Pregnancy. Abnormal conditions of the mouth and teeth are common affections during pregnancy and demand careful attention. An inflammation of the gums due to the blood-changes of pregnancy is frequently observed. The gums become swollen and tender and bleed at the slightest touch; they are also retracted from about the teeth, and a thin fluid or pus exudes from around the neck of the tooth. The teeth are apt to become loose through the suppurative and ulcerative changes in the periosteum and may finally drop out through lack of retaining attachments. Such teeth may be entirely free from caries.

Treatment. The careful attention of a dentist is necessary. All deposits of tartar due to an altered condition of the saliva must be regularly removed. All abscesses, leaky fillings and cavities should receive prompt attention.

Actual decay of the teeth or caries is also common during pregnancy. The cause of caries during pregnancy is not a deficiency of lime-salts in the blood, but is the presence of an acid either in the perverted secretions of the mucous glands, the acid reaction of the saliva, acid gastric eructations, fermentation of food particles, etc.

Treatment. An alkaline mouth-wash should be freely used. Such a wash may consist of the bi-

carbonate of soda, one-half drachm to an ounce of water, freshly mixed at the time of using, or the milk of Magnesia. All food particles should be carefully removed with the brush and floss silk. Homœopathic remedies are valuable for the relief of special symptoms. The following remedies may be consulted :

Belladonna. Teeth and gums sore to pressure < when lying down. Dryness in the mouth and throat. Especially indicated when the pain causes great restlessness.

Chamomilla. Patient very irritable, and inclined to cry. Pain in decayed tooth after taking cold when in a perspiration. Pain worse at night, returning at intervals, and unbearable. Decayed tooth feels long and is loose.

Coffea. Severe stinging, jerking pain > by holding cold water in the mouth. Patient frantic with the pain; does not know what to do.

Mercurius vivus. Swelling of gums excessive. Pain affects the whole side of the face extending into the ear. The teeth are decayed and loose.

Pulsatilla. Stinging pain in decayed teeth. Left side usually affected. Pain extends to the ear with heat and chills over the body. Pain > by drawing cold air into the mouth and by walking about. Pain < when sitting and toward evening.

Staphisagria. Decayed teeth. Pain < from cold applications. White, ulcerated gums, swollen and throbbing, painful to touch. Pain < at night and toward morning.

Tetanus Neonatorum. See *Infant, New-born, Diseases of.*

Tetany During Pregnancy. Tetany is a condition characterized by tonic spasms beginning in the muscles of the extremities. In severe cases the entire muscular system may be affected. There is no loss of consciousness, and the attacks are intermittent and of short duration. The application of cold causes the spasm to cease. The flexor muscles, and especially the interossei in the hands and feet, are affected with the greatest frequency. This affection is usually observed in women during the child-bearing period or during menstruation. The prognosis is favorable, although fatal cases have been reported. Pregnancy is not interrupted nor is labor more difficult. As soon as the uterus is emptied, the spasms usually cease.

Treatment. It is not necessary to induce abortion, as the disorder usually yields to appropriate treatment. Vomiting or diarrhoea requires especial attention. The following Homœopathic remedies should be consulted: *Aconite*, *Belladonna*, *Cicuta*, *Cuprum*, *Ignatia*, *Nux vomica*, *Passiflora*, and *Rhus tox*.

Thrombosis in Pregnancy. See *Varicose Veins in Pregnancy*.

Thrush in New-born. See *Infant, New-born, Diseases of*.

Tongue-tie, Congenital. Frequently the frenum of the tongue binds this organ to the floor of the mouth. This condition interferes with suckling and may prove an obstacle to proper speech. The treatment consists in raising the tongue with the fingers, thus rendering the frenum tense, snip-

ping the membrane with scissors, and completing the separation by tearing with the finger. Care must be taken not to cut too deeply.

Toothache of Pregnancy. See *Neuralgia in Pregnancy*.

Toxemia of Pregnancy. The existence of a special toxemia of pregnancy is now well recognized by obstetricians. The exact nature of the poison or poisons which produce the symptoms grouped under the term, toxemia of pregnancy, has not been fully determined. Faulty metabolism is undoubtedly the underlying cause. The excretory organs are probably at fault when toxemia develops. The poisons produced in the body of the mother and the fetus are animal poisons, alkaloidal in nature, and termed toxins. The nervous system of the pregnant woman is especially susceptible to the action of these poisons. Within the last five years the theory of the origin of the poison material has undergone marked changes. Insufficient elimination by the kidneys was formerly considered the important factor in etiology. To-day hepatic insufficiency is considered of more importance than the kidney condition.

Pathology. Pathological changes chiefly affect the liver, the kidneys, and the spleen. Lesions of the liver are constantly present in fatal cases. Degenerative changes followed by necrosis are the usual lesions. The appearances in the kidney upon autopsy are very irregular. The specific kidney of pregnancy may appear under a variety of forms,

and acute or chronic nephritis may also be present. The spleen, like the liver, shows fatty degeneration followed by necrosis.

Symptomatology. The symptoms referable to the stomach and the liver are nausea and vomiting associated with pain and tenderness over the epigastrium and over the liver. It will be remembered that these pains are present in severe cases of the nausea and vomiting of pregnancy. Toxemia is now considered the cause of pernicious vomiting of pregnancy in most cases. The symptoms dependent upon kidney lesions consist in the presence in the urine of ammonia compounds, amido acids, etc., showing that the normal metabolism of the kidney is not completed. The symptoms showing the effect of the poisonous materials upon the nervous system are most characteristic and diagnostic. Headache, lassitude, disturbances of vision, of hearing, of taste, restlessness, sleeplessness or hebetude, irritability or apathy, stupor and coma are significant symptoms. Pigmentation of the skin and marked pruritus are believed to have a toxic origin. Jaundice is not a common symptom in either mild or severe cases of toxemia. When jaundice does occur it usually is dependent upon the condition of the blood and not upon hepatic insufficiency. The toxemia of pregnancy may be classified in various ways from a clinical standpoint. We may recognize *fulminant*, *acute*, *subacute*, and *chronic* or *benign* types.

Fulminant Type. Death may occur in twenty-four hours from a toxemia of this type. The pa-

tient rapidly passes into a state of coma, and death speedily follows. The lesions found on autopsy are those of acute yellow atrophy of the liver.

Acute Type. In typical cases of this type three stages can be distinguished. The symptoms of the first stage are prostration, headache, and vomiting. The second stage is marked by symptoms caused by involvement of the cerebral cortex and the nerve-centers in general. Restlessness, agitation, insomnia, and mental confusion, passing into convulsions, maniacal excitement, and delirium are common symptoms. The terminal stage is marked by apathy, somnolence, stupor, coma, and death. In *typical* cases of acute toxemia the liver always shows marked pathological changes. In *atypical* cases the liver may appear normal, while other organs, as the kidney or the brain, may show extensive lesions. One marked characteristic of acute toxemia is its unexpected appearance. It appears in many cases without the slightest warning, and often in women apparently in robust health. No period of pregnancy is exempt. Recovery from acute toxemia must be very rare. The fetus usually dies before delivery. Emptying the uterus has no effect upon the course of the disease.

Sub-acute Type. The chief varieties of this type are expressed clinically as *eclampsia* and *pernicious vomiting*. In this type the termination of pregnancy usually has a beneficial effect, although there are numerous exceptions. Eclampsia differs

from the acute toxemia of pregnancy, in its occurrence as a rule late in pregnancy, and in its dependence largely upon mechanical factors. While the liver may be diseased in cases of eclampsia, the organ largely at fault is the kidney. Eclampsia, therefore, is amenable to treatment by eliminative and dietetic measures. Acute toxemia is almost invariably fatal. While the relationship of pernicious vomiting to toxemia is not so apparent, the opinion is gaining ground that such a relationship exists.

Benign Type. The symptoms of the benign type are nausea and vomiting, not severe in nature, loss of appetite, perverted tastes, chloasma, vertigo, pruritus, etc. The only significance of these symptoms is to indicate a tendency to toxemia. The common occurrence of such symptoms throws considerable doubt upon the propriety of classing them under the heading of toxemia. The fact that many of these symptoms disappear as pregnancy advances is explained by the assumption that the maternal organism is able to throw off the toxemia, if not too severe.

Diagnosis. The diagnosis is made by the recognition of the various types of hepatic insufficiency, and by the clinical symptoms, especially those referable to the nervous system. It is therefore necessary in all suspected cases to make a careful physical examination of the liver and spleen and to have the urine examined by an expert. The work of the kidneys must be carefully measured and the amount of excretion by these organs must be

definitely known. Nervous symptoms must be carefully sought and their value determined. In the diagnosis of the particular type of the disease, we must always bear in mind the possibility of the fulminant type, whenever a pregnant woman is taken violently ill. To make an exact diagnosis in these cases may not be possible. In the acute type, when typical, a diagnosis should be possible from a physical examination of the liver, and from the urinary findings, combined with the rational signs. The diagnosis of the subacute type has been considered under Eclampsia and Pernicious Vomiting. In the diagnosis of the benign type, the examination of the urine for leucin and tyrosin is helpful. If these bodies are present in the urine, the physician is thereby warned of the possibility of toxemia and can forestall serious results.

Treatment. A strict observance of the hygienic rules of pregnancy is highly important in the *prophylactic* treatment of toxemia. All the organs of elimination should be carefully watched, and the slightest indication of insufficient action is a signal for active treatment. The methods of stimulating the excretory organs and of lessening the demands upon them are fully described under the treatment of Eclampsia. *See Eclampsia.*

The *curative* treatment of toxemia demands a careful study of the symptoms in all cases and prompt action in most. Elimination is naturally the key-note of treatment. In addition to an exclusive milk diet and stimulation of all the eliminating organs, the free use of normal salt solution

by the bowel and by intravenous injection is of great value. In severe cases the intravenous injection is preferable, as there is good reason to believe that the bowel fails to absorb the salt solution in desperate cases. Finally the careful selection of the Homœopathic remedy is undoubtedly helpful.

Tuberculosis in Pregnancy. The influence of pregnancy upon tuberculosis is most unfavorable, and many authorities believe that a considerable number of cases of tuberculosis develop solely as a result of pregnancy. The strain of child-bearing exhausts the vitality of the tuberculous woman so seriously that her death is hastened by many months, and any possible chance of arresting the disease is lost. It is the duty of the physician to advise against marriage in the case of a woman already infected with or predisposed to tuberculosis. There are some exceptions to this general rule. Thus in *fibroid phthisis* pregnancy appears to have but little deleterious influence. In sharply localized tuberculosis, no bad effects are noticeable during pregnancy. In fact, the woman seems to be in better general health owing to the necessity of more vigorous efforts on the part of the lungs to obtain sufficient air. After delivery, however, when this extra effort is no longer necessary, the local affection of the lung often progresses with great rapidity, and general tuberculosis develops.

Acute miliary tuberculosis is rapidly fatal in pregnancy or soon after the delivery. It may be mistaken for septic infection.

Typhoid Fever in Pregnancy. Typhoid Fever is a grave complication of pregnancy. Pregnancy is interrupted in fully one-half of all cases. The causes of the death of the fetus are continued high temperature, hemorrhage in the endometrium or in the membranes of the ovum itself, and a depressed condition of the maternal circulation, with asphyxiation of the child. It is asserted that the fetus may become infected. The treatment of typhoid fever in pregnancy is essentially the same as in the non-pregnant state. The temperature should be controlled as much as possible on account of the serious influence of continued high temperature upon the fetus. Cold baths have given good results, but sponging at frequent intervals will usually suffice.

The occasional occurrence of typhoid fever in the puerperium should be remembered, and care should be taken not to mistake it for puerperal sepsis.

Umbilical Cord, Prolapse of. By prolapse of the cord is meant descent of the cord in advance of the presenting part. If the membranes are unruptured when this accident occurs, the condition is known as presentation of the cord. In most cases the two arms of the loop of prolapsed cord are in apposition, but in some cases the presenting part intervenes. The most common position in which the loop is found is in front of one of the sacro-iliac joints or in front of the cotyloid cavity. It is rarely directly anterior or posterior.

Frequency. The frequency of prolapse of the cord varies between wide limits. Some authori-

ties say once in 65 cases, while others say once in 500 cases. It is more frequently observed in hospital practice.

Etiology. A want of correspondence between the presenting part and the lower segment of the uterus is the essential cause of prolapse of the cord. Hence malpresentations, deformities of the head, and contractions of the pelvis act as predisposing causes. Other possible causes are: An excessive quantity of liquor amnii; the woman standing or sitting when the membranes rupture; excessive length of the cord; low implantation of the placenta; pendulous abdomen; multiple pregnancy, and multiparity.

Diagnosis. The diagnosis is readily made when the cord is in the vagina, and the membranes have ruptured. If the membranes are unruptured, the diagnosis is not difficult, if the cord is still pulsating. If pulsations have ceased, the diagnosis is not so easy, but can usually be made by hooking the finger in the loop and pressing it against the presenting part.

Prognosis. The prognosis for the *mother* depends upon the gravity of the abnormality which caused the cord to prolapse, and upon the operation demanded. For the *child* the prognosis is not good. The infantile mortality ranges from 40 to 50 per cent. The great danger to the child is from asphyxia due to compression of the cord. Head presentations are most dangerous, while shoulder or breech presentations are more favorable. Prolapse early in the labor is very unfavorable. If

considerable pelvic contraction exists, thus preventing rapid delivery, the prognosis for the child is not good.

Treatment. Many cases occur through improper management of labor. Premature rupture of the membranes should be avoided. The waters should never be allowed to pour out from the uterus when the woman is either standing or sitting. When the liquor amnii is in excess of the usual amount, a gradual escape of the waters should be secured by partially tamponing the vagina with gauze. When conditions favor a prolapse of the cord, keep the woman in the dorsal posture during the first and second stages of labor. If the child is dead when the prolapsed cord is discovered, no treatment is necessary. The death of the child must not be assumed because the cord is pulseless, but must be determined by careful and repeated abdominal auscultation. In prolapse of the cord before dilatation of the cervix has occurred active interference is not required. Caution the patient against straining and preserve the bag of waters as long as possible. Have the patient assume the knee-elbow position or the latero-prone position upon the side opposite to that upon which the prolapse occurs.

If the fetal heart sounds begin to fail, push up the cord between pains while the patient is in the knee-chest position. If the cord does not return, rupture the membranes, and secure descent of the head either by pressure upon the fundus or by the use of forceps. When a loop of the cord is in the

vagina and the cervix is fully dilated, no interference may be necessary, if the pulsation in the cord is good and the head is coming down rapidly. If the pulsations become feeble, delivery with forceps is the proper procedure, if the head is well engaged and in a favorable position. If the head is not engaged, the two alternatives are manual or instrumental reposition, or podalic version. Too much handling of the cord is so dangerous to the fetus that many authorities advise version in all cases. If reposition is attempted the hand is preferable to any instrument. With the patient on the left side and under an anesthetic, a hand is inserted into the vagina, the cord is grasped and carried past the head, which is pressed to one side to allow the cord to pass. The hand on the abdomen then presses the head down into the cervix while the internal hand receives and adjusts the head in proper position. The anesthetic is withdrawn and the internal hand allowed to remain until six or more labor pains have occurred. In replacing the cord it is well to hook it over some part of the child as the knee or the chin. Even after the cord has been replaced in the manner described, prolapse is very liable to recur. Podalic version is the best treatment under such conditions. After version has been completed the question of immediate delivery depends upon the condition of the fetal circulation. If the heart-sounds are strong and regular, leave the delivery to nature.

Umbilical Cord, Shortness of. Shortness of the cord may be absolute or relative. A relatively

short cord is produced by the coiling of the cord about the neck or limbs of the fetus. An absolutely short cord is one which is too short to permit of delivery of the fetus without rupture of the cord, placental detachment, or uterine inversion. It has been calculated that the minimum normal length of cord is 12 inches in head presentations and 15 inches in breech presentations. Absolutely short cord is of rare occurrence, but undoubted instances have been recorded.

Diagnosis. The symptoms ascribed to short cord are as follows: Marked recession of the head between pains; arterial hemorrhage during and between pains; urination between pains during the expulsive stage; pain over the placental site; desire to sit up and to lean forward; uterine inertia.

Prognosis. The mother is in danger from hemorrhage and inversion of the uterus. Many of the children are still-born.

Treatment. If short cord is suspected, the membranes should be ruptured and manual expression begun. If delivery is delayed, apply forceps. After extraction of the head several coils of the cord may be discovered around the neck. Time is saved by ligating and cutting the cord.

Umbilicus, Infection of. See *Infant, New-born, Diseases of.*

Urine, Examination of. The regular and systematic examination of the urine of the pregnant woman is of the utmost importance. It is not sufficient to take the specific gravity and to ex-

amine for the presence of albumin and sugar. The quantity of urine excreted in 24 hours must be measured, and the percentage of urea determined, in order to obtain a satisfactory idea of the work of the kidneys. If albumin is present in any considerable amount, a microscopical examination should be made. The urine should be regularly examined every two to three weeks after the fifth month. The patient should be instructed to watch the urine, and to report to the physician at once any deviation from normal conditions. The importance of a low percentage of urea as related to eclampsia and the toxemia of pregnancy is well established. While it is not now believed that the retention of urea in the system is the sole cause of eclampsia or toxemia, it is true that the amount of urea excreted is a valuable guide in estimating the excretory activity of the patient. By careful attention to the urine many cases of eclampsia may be avoided.

Urine, Retention of, in the Puerperium. The common occurrence of retention of urine after delivery has already been described. *See Puerperium, physiology of.* The length of time which the patient can retain her urine without symptoms of repletion varies from twelve to twenty-four hours. In the treatment of this condition the catheter should be withheld as long as possible. Friction over the bladder and the use of hot compresses should be tried. The sound of running water is an expedient which is often successful. If these measures fail, and there is no contra indi-

cation, the patient should be allowed to assume the sitting posture in bed upon the vessel or douche pan. This procedure is practically devoid of danger and may obviate the necessity of using the catheter.

Uterus, Changes in During Pregnancy See *Pregnancy, Physiology of.*

Uterus, Inversion of. See *Inversion of Uterus.*

Uterus, Rupture of. Rupture of the uterus may occur during gestation, labor, or the puerperium. If the rupture involves all the coats of the uterus, it is called complete. If the peritoneal coat is not injured, the rupture is incomplete. The seat of the injury is almost exclusively the lower segment of the uterus. Spontaneous rupture of the uterus may occur during pregnancy from rapid stretching of the uterine wall or from cystic degeneration of the chorion. Rupture may also occur in the puerperium from a dissecting metritis, or from sloughing following prolonged pressure of the fetal head. The vast majority of ruptures of the uterus occur during the second stage of labor.

Frequency. About once in 1000 cases of confinement.

Pathology. The rupture begins in the lower segment of the uterus. This portion is subjected to great distention and consequent thinning in difficult labors. The seat of rupture is usually lateral, and the left side is more frequently affected. The extent of the injury varies from a small tear, scarcely admitting the tip of the finger, to a rent large enough to permit the escape of the child

and the placenta into the abdominal cavity. The direction of the tear may be vertical, transverse, or oblique. Usually the edge of the wound presents a rough and jagged appearance owing to the contractibility of the muscular fibres. The tear may extend downward into the vagina or upward into the fundus of the uterus. Exceptionally the tear may involve the bladder. If the patient lives for forty-eight hours there may be found on autopsy a large quantity of blood in the abdominal cavity. The tissues at the margins of the wound are swollen and ecchymosed, or there may be patches of necrosis.

Etiology. The causes of rupture of the uterus are *predisposing* and *exciting*. Among the predisposing causes may be mentioned hydramnios, multiple pregnancy, and hydrocephalus. These conditions predispose to rupture by causing excessive distention of the uterus. Degenerative changes in the muscular fibres of the uterus, malignant disease of the uterus, syphilitic affections of the uterus, or fibroid tumors act as predisposing causes by weakening the uterine walls. Traumatism of various sorts is a predisposing cause. Any condition which causes disproportion between the fetus and the birth-canal, or which obstructs the birth, may predispose to rupture. Thus malpositions or malpresentations of the fetus, or the resistance offered by a rigid cervix, or marked uterine obliquity may act as predisposing causes. Rupture is far more common among multiparæ.

Exciting Causes. Traumatism and excessive

uterine contraction are the main exciting causes. Traumatism includes blows, falls, and kicks, and unskilful or violent manipulations by the obstetrician. The use of ergot before the completion of the third stage of labor is often the determining cause of rupture. In all cases of disproportion rupture occurs in one of two ways; either as a result of excessive and prolonged contractions, which thin the lower uterine segment until it finally gives way, or in consequent of the compression of the uterine wall between the presenting part and the bony pelvis.

Symptoms. Premonitory symptoms are present in the majority of cases. There are excessive pains through the lower part of the abdomen, not ceasing with the cessation of the uterine contractions. The patient develops great anxiety and restlessness. The retraction ring may be felt through the abdominal wall, and its ascent toward the umbilicus is most significant of impending rupture. The rupture itself always takes place during a uterine contraction, and is usually accompanied by an intense pain, differing entirely from a normal labor pain. Sometimes there is a sound of tearing tissue. Collapse and symptoms of internal hemorrhage follow. The labor-pains suddenly cease; external hemorrhage from the vagina usually occurs; the patient's skin becomes cold and clammy; the respirations are rapid and shallow; the pulse is frequent and almost imperceptible. Nausea, vomiting, and syncope frequently ensue. A physical examination reveals a

marked change in the shape and feel of the abdomen, and tenderness at the seat of the rupture. If the fetus escapes into the abdominal cavity, the fetal parts may be palpated, and apart from them may be felt the contracted uterus. Upon vaginal examination, the presenting part will be found to have receded, and a loop of intestine may be found prolapsed. While the characteristic symptoms of rupture are usually present, many cases are on record in which all the characteristic symptoms were absent, and the true diagnosis was revealed only at the autopsy. The possible terminations of rupture of the uterus are: (1) cicatrization and healing; (2) rapid death from hemorrhage and collapse; (3) retarded death from peritonitis and septicemia.

Prognosis. Rupture of the uterus is the most serious complication of labor. Over 90 per cent. of the children are born dead. The maternal mortality under the best modern treatment is fully 60 per cent. Cases which are not given the benefit of modern surgical treatment show a mortality of from 90 to 95 per cent. Fetal death is due to asphyxia. The death of the mother may result from shock, primary or secondary hemorrhage, peritonitis, or septicemia.

Treatment. The *prophylactic treatment* is most important. All cases having obstructed or prolonged labor should be carefully watched for symptoms of over-distention and dangerous thinning of the lower uterine segment. When the retraction ring is felt half-way from the pubes to the umbili-

cus, labor should be terminated as speedily as possible. Chloroform should be administered to the full surgical degree in order to secure complete relaxation. The mode of delivery varies with the nature of the case. In shoulder presentations some authorities advise version, if the child is living, while others consider decapitation a safer procedure. In head presentations version should never be attempted, as undue strain is put upon the uterine walls. The careful application of the forceps is the best procedure. Failing with the forceps, the choice lies between Cesarean section and craniotomy upon the living child. If the child is dead, craniotomy is the preferable operation. In performing version or in the use of the forceps all violent manipulations must be avoided.

Curative Treatment. After rupture has occurred the indications for treatment are to deliver the child and the placenta as soon as possible, to control the hemorrhage, and to repair the laceration if practicable. If the fetus lies wholly, or, for the most part, within the uterus, delivery through the natural passages should be attempted. In head presentations the forceps should be employed. In shoulder presentations version can usually be performed. The placenta should then be removed by expression or by manual extraction, and blood-clots removed. The uterus contracts promptly, as a rule, and hemorrhage ceases. The patient should now be allowed to rest, and stimulants should be administered until she rallies. After the patient is in better condition the question of

further treatment must be considered. Laparotomy is necessary in most cases. If operation is decided upon, a supra-vaginal hysterectomy offers the best chance for recovery, when infection is probably present, when there is great anæmia, and in cases in which the laceration is large or the peritoneum stripped up for a considerable distance. When the uterus is not removed, the laceration is repaired with sutures. Many successful cases have been reported. If an operation is deemed unwise, the vagina should be thoroughly irrigated with a mild antiseptic solution, and a drain of sterile gauze inserted into the tear in the uterus and allowed to protrude into the vagina. A firm abdominal binder is applied, and full doses of ergot are given. The first indication of peritonitis calls for laparotomy.

When the child has escaped entirely, or for the most part, into the abdominal cavity, laparotomy is the only possible treatment, and hysterectomy offers the best prospect for recovery.

Vaginal Examinations in Pregnancy. A vaginal examination is necessary in women pregnant for the first time, and in others whose history leads to a suspicion of pelvic deformity. This examination should be made about a month before the date set for confinement in conjunction with the abdominal examination already described. The objects of this examination are to learn the condition of the soft parts, to confirm the diagnosis of presentation, to detect a possible placenta prævia, and to determine the capacity of the bony

pelvis. Before making the vaginal examination the physician's hands and the external genitals of the patient must be cleansed with the same care that is observed during labor. In multiparæ, the vulva, the vagina, and the cervix are examined for injuries resulting from former labors. Search is made for pathological growths or congenital defects of the soft parts, which may complicate labor. A low implantation of the placenta should be readily detected. The most important part of the examination is internal pelvimetry, or the determination of the capacity of the bony pelvis. The hand, as a rule, is the best instrument. See *Pelvimetry, External and Internal*.

Vaginal Secretions in Pregnancy. See *Auto-infection*.

Vaginismus. Vaginismus, or spasmodic contraction of the vagina, is almost peculiar to first labors. As a rule, chloroform will overcome this condition. If anesthesia fails, manual dilatation or deep incisions should be employed, with subsequent application of the forceps in obstinate cases.

Vaginitis, Puerperal. See *Infection, Puerperal*.

Varicose Veins in Pregnancy. Dilatation of the veins of the rectum and of the lower extremities, often extending to the vagina and the vulva, is very common in pregnancy, especially in multiparæ. Varicosities may also occur within the pelvis, especially in the broad ligaments. Rupture of varicose veins in the bladder may cause hæmaturia. The cause of these varicosities is mainly the obstruction to the return circulation by the

pressure of the gravid uterus. This disorder is usually progressive from below upward and may become so extreme that locomotion is almost impossible. The possibility of rupture should always be remembered. Thrombosis and phlebitis are possible complications. The patient complains of pain upon standing or walking, and an itching sensation over the dilated vein.

Treatment. Constipation should be avoided, and the patient should be in the recumbent position as much as possible, with hips and legs elevated. Mechanical support by an elastic stocking for the legs, and a pad and T bandage for the vulva, is a valuable adjuvant in the treatment. *Calcarea fluorica* 3x should be administered persistently three or four times daily. If the varicose veins become inflamed a choice of remedies may be made from the following: *Arnica*, *Belladonna*, *Ferrum phos.*, *Hamamelis* and *Pulsatilla*.

Variola in Pregnancy. Variola tends to run a severe course in the pregnant woman. Mild cases, of course, occur in certain epidemics and in women who have formerly been vaccinated. The frequency with which abortion occurs varies with the intensity of the disease. Vaccination during pregnancy protects both mother and child and should be performed whenever variola is epidemic.

Vernix caseosa. This whitish substance, which covers the skin of the new-born infant more or less completely, is composed of the dead and shed epithelium mingled with the secretions of the sebaceous glands. The primary function of this

coating is to protect the fetal skin from maceration by the amniotic fluid. The removal of the vernix caseosa after birth is facilitated by anointing the skin with warm sweet oil before the bath is given.

Version. Version is a manual operation by which the long axis of the fetus is made to coincide more or less completely with the long axis of the uterus, or one end of the child is substituted for the other.

Classification. There are three *varieties* of version: cephalic, podalic, and pelvic. There are also three *methods* of performing version: external, combined external and internal, or bipolar, and internal. Cephalic version causes the head to present; pelvic version, the breech; and podalic version, one or both feet.

Frequency. About once in 50 labors.

Indications and Limitations. Version is indicated in transverse presentations, in unfavorable presentations of the head which prevent spontaneous delivery, in contracted pelves under certain conditions, and in normal pelves and head presentations, when rapid delivery is necessary. In order that version may be successful, certain conditions must be present. The amniotic liquid must be wholly or in part retained within the uterus. Rigid and permanent contraction of the uterine muscle, known as tetanus of the uterus, must be absent. The lower uterine segment must not be excessively distended and thinned, as shown by the complete development and high position of

the retraction ring. The presenting part must not be impacted. The dangers of version to the mother are rupture of the uterus, shock, increased risk of septic infection, hemorrhage, and laceration. To the child the dangers are fracture of the femur or of the humerus, together with the usual risks of breech labors.

Cephalic Version. Theoretically cephalic version should be preferred to podalic version in all but a few exceptional cases. Practically cephalic version is seldom employed because of the dexterity required on the part of the operator, the ease with which podalic version can usually be done, and the frequent necessity for rapid delivery after version. The most favorable time for the performance of cephalic version is just before the commencement of labor, or, at the latest, before the amniotic liquid has escaped. There must be sufficient relaxation of the uterine walls, and the abdominal walls must not be tense, tender, nor thickly padded with fat.

Cephalic version is indicated mainly in shoulder and breech presentations, but not when rapid delivery is demanded.

External Cephalic Version. The bladder and the rectum should be empty. The patient is placed on her back with the thighs flexed upon the body. Anesthesia is not required unless the patient is nervous and extremely sensitive. The presentation and position of the fetus must be known with certainty. In shoulder presentations and in oblique positions of the fetus it is always desirable

to have the head take the shortest road to the pelvic inlet, and in breech presentations we should endeavor to have the fetus revolve occiput first, in order to avoid extension of the head.

In attempting to replace a breech by a vertex presentation the breech is first lifted into one iliac fossa, while at the same time the head is pushed to the other side by the palm of the other hand over the fundus. By pushing up the breech and bringing down the head, a head presentation may ultimately be obtained. A vaginal examination should be made to verify the presentation as changed. To maintain the new presentation a bandage may be applied or pads upon each side of the uterus. If the patient is in labor, she should be kept in the dorsal position until the head is well engaged in the pelvic inlet. As soon as the dilatation of the os warrants it, the membranes may be ruptured to hasten engagement of the head. In shoulder presentations external cephalic version should be tried whenever the pelvis is sufficiently large and it is not likely that rapid delivery will be necessary.

Combined or Bipolar Cephalic Version. The dorsal posture is usually the most convenient. Anesthesia is not always necessary, but usually desirable. The special conditions necessary in combined version are that the liquor amnii be wholly present or so recently present that the child is fairly movable, and that the cervix will admit two fingers. Combined cephalic version finds its greatest sphere of usefulness in shoulder

presentation. A certain diagnosis of the exact position of the fetus is absolutely essential. For the internal hand the operator should use the one the palm of which would naturally face the fetal breech. Thus in right scapular positions of the shoulder he should use the left hand internally. Two fingers should be passed through the os uteri. With the external hand steadying the head, the two fingers of the internal hand push the point of the shoulder upward and toward the side of the uterus occupied by the breech. The external hand at the same time pushes the head down into the pelvic inlet, where it is received by the two internal fingers. For the version to be completed the long axis of the fetus must coincide with the long axis of the uterus. In some cases the breech will not rotate into the fundus even after the head is at the brim of the pelvis. In such cases the vaginal hand should be withdrawn, the external hand still holding the head at the inlet, and the breech pushed into position by the disengaged hand. The head must be held in its new position until it engages, or the membranes may be ruptured to hasten engagement. In converting a breech presentation into a vertex by combined external version the principle to be followed is to have the fetus revolve "occiput first" within the uterine cavity. So in left sacro positions of the breech use two fingers of the right hand internally to push the fetal breech to the mother's right, and the occiput will traverse the left wall of the uterus. As soon as the breech has disappeared from the touch

of the internal fingers they remain quiet until the point of the shoulder is left. This is pushed upward by a movement of flexion in the direction the breech has taken. After the shoulder has been passed, the internal fingers await the coming of the head. In right sacro positions the left hand is used internally and the right externally.

Internal Cephalic Version. This operation is rarely performed. It is more difficult than combined or internal podalic version and the maternal prognosis is not so good.

Podalic Version. Podalic version is indicated: (1) In shoulder presentations when cephalic version has failed or the conditions are unfavorable for its performance. (2) In head presentations when the prognosis is bettered by feet-first delivery, as in contracted pelvis; prolapse of the cord or extremities; in face and brow presentations under certain conditions, and in persistent occipito-posterior positions at the pelvic inlet. (3) In certain emergencies either for the control of hemorrhage or for rapid delivery.

External Podalic Version is never employed.

Combined or Bipolar Podalic Version. Bipolar podalic version may be tried in shoulder presentations in which cephalic version has failed, or in cases in which it is desired to bring down a leg to control hemorrhage as in placenta prævia. The advantage of the bipolar method over internal podalic version is that there is less danger of infecting the uterus. The disadvantage is that the finger-tips have but a limited control over the parts

of the child that successively come within reach. Anesthesia is usually necessary. The patient should be in the dorsal posture, preferably upon a table. The internal hand should be the one whose fingers naturally flex toward the fetal head. Two fingers of the proper hand are passed through the os, while the external hand rests over the fetal breech. The presenting shoulder is now gently pushed upward toward the head and in the direction of the fundus. At the same time the external hand pushes the breech down to take the place of the shoulder in the lower uterine segment. The most available knee or foot, which is usually the anterior, is now sought by the internal fingers and hooked down through the os into the vagina. The external hand is now transferred from the breech to the head, which is pushed upward into the fundus uteri.

In cephalic presentations bipolar podalic version may be attempted if the head is not too firmly engaged. A movable fetus and exact diagnosis of the presentation and position are necessary for success. In left dorso positions the left hand should be used internally, and in right dorso position the right hand. The internal fingers by a movement of flexion gently push the head upward in the direction of the occiput, while the external hand pushes the breech by a gentle sliding motion in the opposite direction. As the head passes out of reach of the internal fingers, the external hand continues to push the breech and the feet downward into the lower uterine segment, until a knee

or a foot can be grasped by the internal fingers. As soon as a knee or a foot can be grasped, the membranes, if still intact, should be ruptured. The external hand is now transferred from the breech to the head, which is gently pushed upward into the fundus, while the foot is drawn down through the os into the vagina. The anterior foot should be seized if possible.

Internal Podalic Version. This is by far the most common method of version. The operation consists in the introduction of the whole hand into the uterus, seizing a foot or two feet, bringing it or them into the vagina through the cervix, and pushing the fetal head into the fundus by the external hand. The dangers of internal podalic version to the mother and to the child are considerable, and the operation should not be done without due consideration.

Injury to the maternal soft parts, even to the extent of rupture of the uterus, and septic infection are the chief dangers to the mother, while the delivery of the after-coming head is the cause of numerous fetal deaths.

Conditions Necessary and Contra-Indications. Pelvic deformity must not be too great. The true conjugate should not be under 8 centimeters ($3\frac{1}{2}$ inches). The cervix must be completely dilated or dilatable. Tetanic contraction of the uterus must be absent, and it is highly desirable that the membranes should not be ruptured or should only recently have ruptured. A retraction ring more than four inches above the symphysis pubis

renders the operation extremely hazardous, owing to the danger of uterine rupture. If the head is impacted in the pelvic inlet, version is contra-indicated. Internal version should not be performed for a macerated or dead fetus.

Preparations for the Operation. One physician to give the anesthetic is almost indispensable. A second to assist the operator is desirable. The bladder and the rectum should be empty. The dorsal posture of the patient upon a high table is most advantageous in the majority of cases. Thorough antisepsis is absolutely essential. Anesthesia is always required, as it is important to secure the greatest possible relaxation of the uterus. Chloroform gives the more complete relaxation, but ether is preferred by some operators on account of its greater safety.

Choice of Internal Hand. In left dorso positions use the left hand internally; in right dorso positions, the right hand. This rule applies especially to cephalic presentations.

Steps of the Operation. The steps of the operation are four in number: (1) the introduction of the hand; (2) recognition and seizure of one or both feet; (3) turning of the child; (4) extraction of the child.

Introduction of the Hand. The sterile hand anointed with vaselin is slowly pressed through the vulva by a rotary motion. The operator should push steadily but gently through the cervix, and having passed that opening should flatten out the hand and slowly slip it along with-

out violence upward to the fundus. If a uterine contraction occurs at any time, all upward movements of the internal hand must cease and the hand lie flat against the uterine wall until the contraction is over. If the membranes are unruptured, it is advisable to break through them a short distance within the cervix. If pulsating loops of cord are detected, rupture the membranes higher up. Working within the amniotic sac reduces the dangers of infection to a minimum. The operator's fingers are held together to prevent the cord from slipping in between them. Compression of the cord is avoided whenever possible. If compression is unavoidable, the remainder of the operation must be hastened. The external hand over the fundus presses the breech downward in order to bring the feet within reach of the internal fingers. When the hand has been introduced as far as the child's navel the knees will be felt. The feet are usually found near the fundus, applied to the child's breech. The operator must not hesitate to push the internal hand to the fundus in order to secure a firm hold upon the feet.

Seizure of the Feet. If one leg only is to be brought down, it is better to bring down the anterior. If both feet can be grasped and the cervix is wide, both may be brought down. The foot is recognized by the large prominence of the heel. The knee flexes toward the head, the elbow toward the breech.

Turning. The operator draws the leg down-

ward to the hollow of the sacrum and across the patient's body in the direction of the child's head. The external hand now pushes the head up toward the fundus. After the foot has been drawn well down, if version is not complete, the leg that is down may be secured by a fillet. Then the outer hand grasping the fillet makes traction downward, while the inner hand lifts up the shoulder and head toward the fundus. The operation is complete when the child's breech is engaged in the pelvic inlet.

Extraction. When the version is completed, the operator examines the fetal heart and considers the mother's general condition, to decide whether the child should be delivered at once, or whether it is safe to leave the expulsion of the child to nature. In any condition threatening the life of mother or child, immediate extraction is advisable.

In shoulder presentation internal podalic version may be required. The preparation of the patient and the general principles of management are the same as in cephalic presentations. The internal hand should be the left in left scapular positions and the right in right scapular positions. In case an arm is prolapsed in the vagina a sling should be attached to the wrist. By this method the arm is prevented from becoming extended and thus delaying the extraction of the after-coming head.

In shoulder presentations which have been allowed to take their course until the shoulder has become impacted version is attended with con-

siderable danger. Decapitation is the safest procedure, if the child is dead. Symphyseotomy or Cesarean section may be considered, if the pelvis is narrow and the child is living. If version is attempted, anesthesia to the surgical degree is absolutely essential. Some means must be employed in these cases to secure more powerful traction on the leg than can be obtained by the use of the internal fingers. The sling applied to the leg is the best means of obtaining the necessary amount of traction. The internal hand pushes firmly upward on the shoulder, while traction is made upon the leg by means of the sling.

Pelvic Version. By this method of version the breech is made to present by external, internal, or combined manipulation. Pelvic version is practically obsolete at the present time.

Walcher's Position. In the Wälcher position the patient is placed on her back in such a manner that the sacrum rests upon the edge of the bed or table, the thighs and the legs hanging down by their own weight. The effect of this posture is to increase the pelvic inclination and to slightly increase the true conjugate diameter of the pelvic inlet. The increase in the conjugate diameter varies from one-fourth to one-half an inch. The existence of a limited amount of motion at the sacro-iliac synchondrosis explains the increased length of the conjugate diameter in this position. The ilia rotate forward and downward. The angle made by the plane of the brim with the horizon is increased, and the symphysis pubis is

brought a little forward and downward and further from the sacrum. Walcher's position is useful in labor in contracted pelves where the disproportion between the head and the pelvic inlet is slight. In the performance of version the Walcher position is often advantageous. In cases of disproportion between the head and the pelvic inlet, in which the use of the forceps is indicated, the Walcher position will prove helpful.

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